ORDER NO. HAD85052561A9

# Service Manual

## Turntable System

## SL-L2

**Color**

(S)..... Silver Type
(K) .... Black Type

| Color | | Areas |
|---|---|---|
| (S) (K) | [E] ..... | Switzerland and Scandinavia. |
| (S) (K) | [EK].... | United Kingdom. |
| (S) (K) | [XL] .... | Australia. |
| (S) (K) | [EG].... | F.R. Germany. |
| (S) (K) | [EB].... | Belgium. |
| (S) (K) | [EH].... | Holland. |
| (S) (K) | [EF] .... | France. |
| (S) (K) | [Ei] ..... | Italy. |
| (S) (K) | [EC].... | Czechoslovakia. |
| (S) (K) | [XA] .... | Southeast Asia, Oceania, Africa, Middle Near East and Central South America. |
| (S) (K) | [PA].... | Far East PX. |
| (S) (K) | [PE] .... | European Military. |
| (S) (K) | [PC].... | European Audio Club. |

QUARTZ Direct Drive
Automatic Turntable System

T4P is the standard mark for plug-in-connector type. Products carrying this mark are interchangeable and adaptable among each other.

**Please use this manual together with the service manual for Model No. SL-L2 [M], Order No. HAD85032458C1.**

# SPECIFICATIONS

## ■ Turntable section

| | |
|---|---|
| **Type:** | Quartz direct drive<br>Automatic turntable system |
| **Features:** | Auto start/Auto lead-in,<br>Auto return,<br>Auto stop,<br>Repeat play,<br>Direct music select play,<br>Forward and backward skip play,<br>Forward and backward search play,<br>Auto size select,<br>Record presence detection |
| **Drive method:** | Direct drive |
| **Motor:** | Brushless DC motor |
| **Drive control method:** | Quartz-phase-locked control |
| **Turntable platter:** | Aluminum die-cast<br>Diameter 30 cm |
| **Turntable speeds:** | 33-1/3 rpm and 45 rpm<br>Auto speed select<br>(Manual selection possible) |
| **Wow and flutter:** | 0.012% WRMS*<br>0.025% WRMS (JIS C5521)<br>±0.035% peak<br>(IEC 98A Weighted) |

*Measured by obtaining signal from built-in frequency generator of motor assembly.

| | |
|---|---|
| **Rumble:** | −56 dB (IEC 98A Unweighted)<br>−78 dB (IEC 98A Weighted) |

## ■ Tonearm section

| | |
|---|---|
| **Type:** | Linear tracking tonearm<br>4-pivot gimbal suspension |
| **Effective length:** | 10.5 cm |
| **Tracking error angle:** | Within ±0.1° |
| **Effective mass:** | 9 g (including cartridge) |
| **Resonance frequency:** | 12 Hz |
| **Tonearm drive motor:** | DC motor |
| **Stylus pressure:** | 1.25 g (fixed) |

Technics

**Matsushita Electric Trading Co., Ltd.**
P.O. Box 288, Central Osaka Japan

**Panasonic Tokyo Office**
**Matsushita Electric Trading Co., Ltd.**
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105, Japan

## ■ Cartridge section

| | |
|---|---|
| **Model No.:** | EPC-P30 |
| **Type:** | Moving magnet stereo cartridge<br>T4P |
| **Magnetic circuit:** | All laminated core |
| **Frequency response:** | 10 Hz ~ 40 kHz |
| **Output voltage:** | 2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity<br>(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500]) |
| **Channel separation:** | 22 dB at 1 kHz |
| **Channel balance:** | Within 1.8 dB at 1 kHz |
| **Recommended load impedance:** | 47 kΩ~100 kΩ |
| **Compliance (dynamic):** | $12\times10^{-6}$cm/dyne at 100 Hz |
| **Stylus pressure range:** | 1.25±0.25 g (12.5±2.5 mN) |
| **Weight:** | 6 g (cartridge only) |
| **Replacement stylus:** | EPS-30ES<br>(Elliptical stylus) |

## ■ General

| | |
|---|---|
| **Power supply:** | For United Kingdom and Australia: AC240 V, 50 Hz<br>For continental Europe: AC 220 V, 50 Hz<br>For others: ~110-127/220-240 V, 50 or 60 Hz |
| **Power consumption:** | 13 W |
| **Dimensions: (W × H × D)** | 43 × 9 × 35 cm<br>(Maximum height when the dust cover is open)<br>39 cm |
| **Weight:** | 5.1 kg |

Specifications are subject to change without notice for further improvement.

# TECHNISCHE DATEN

## ■ Plattenteller

| | |
|---|---|
| **Typ:** | Automatisches Plattentellersystem mit Quarz-Direktantrieb |
| **Eigenschaften:** | Auto-Start/Auto-Zuführung<br>Auto-Rückkehr<br>Auto-Stop<br>Wiederholtes Abspielen<br>Direktmusikwahl<br>Vorwärts- und Rückwärtssprung<br>Vorwärts- und Rückwärtssuche<br>Autom. Größenwahl<br>Schallplattendetektion |
| **Antrieb:** | Direktantrieb |
| **Motor:** | Kollektorloser Gleichstrommotor |
| **Antriebsregel-Methode:** | Quarz-Steuerung QPL |
| **Plattenteller:** | Aluminium-Druckguß<br>Durchmesser 30 cm |
| **Plattenteller-Drehzahlen:** | 33-1/3 und 45 U./min<br>Automatische Drehzahlwahl<br>(manuelle Wahl möglich) |
| **Gleichlaufschwankungen:** | 0,012% WRMS*<br>0,025% WRMS (JIS C5521)<br>±0,035% Spitze<br>(IEC 98A bewertet) |

*Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorteils.

| | |
|---|---|
| **Rumpeln:** | –56 dB (IEC 98A unbewertet)<br>–78 dB (IEC 98A bewertet) |

## ■ Tonarm

| | |
|---|---|
| **Typ:** | Linearabtastungs-Tonarm mit Kardanaufhängung mit 4-Punkt-Drehlager |
| **Effektive Länge:** | 10,5 cm |
| **Spurfehlwinkel:** | Innerhalb ±0,1° |
| **Effektive Masse:** | 9 g (einschließlich Tonabnehmer) |
| **Resonanzfrequenz:** | 12 Hz |
| **Tonarm-Antriebsmotor:** | Gleichstrommotor |
| **Nadeldruck:** | 1,25g (nicht einstellbar) |

## ■ Tonabnehmer

| | |
|---|---|
| **Modell-Nr.:** | EPC-P30 |
| **Typ:** | Beweglicher Magnet-Stereo-Tonabnehmer<br>T4P |
| **Magnetkreis:** | Ganzlamellenkern |
| **Frequenzgang:** | 10 Hz bis 40 kHz |
| **Ausgangsspannung:** | 2,5 mV bei 1 kHz<br>5 cm/s. Null-zu-Spitze, lateral<br>[7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)] |
| **Kanaltrennung:** | 22 dB bei 1 kHz |
| **Kanalabweichung:** | Innerhalb 1,8 dB bei 1 kHz |
| **Empfohlene Endimpedanz:** | 47 kΩ~100 kΩ |
| **Nachgiebigkeit (dynamisch):** | $12\times10^{-6}$cm/dyn bei 100 Hz |
| **Nadeldruckbereich:** | 1,25±0,25 g (12,5±2,5 mN) |
| **Gewicht:** | 6 g (nur Tonabnehmer) |
| **Ersatznadel:** | EPS-30ES (elliptisch) |

## ■ Allgemeine Daten

| | |
|---|---|
| **Stromversorgung:** | ~220 V, 50 Hz |
| **Leistungsaufnahme:** | 13W |
| **Abmessungen: (B × H × T)** | 43 × 9 × 35 cm<br>(Maximale Höhe bei vollständig geöffneter Staubabdeckung)<br>39 cm |
| **Gewicht:** | 5,1 kg |

Die technischen Daten können infolgen von Verbesserungen ohne Ankündigung geändert werden.

# CARACTERISTIQUES

## ■ Section de la platine

| | |
|---|---|
| **Type:** | Entraînement direct par quartz<br>Système de platine automatique |
| **Caractéristiques:** | Démarrage automatique/Entrée automatique,<br>Retour automatique,<br>Arrêt automatique,<br>Audition répétée,<br>Audition sélectionnée musicale directe,<br>Audition de saut vers l'avant et l'arrière,<br>Audition de recherche vers l'avant et l'arrière,<br>Sélection automatique du diamètre d'un disque,<br>Détection de la présence d'un disque. |
| **Système d'entraînement:** | Entraînement direct |
| **Moteur:** | Moteur C.C. sans balai |
| **Système de commande d'entraînement:** | Réglage d'accrochage de phase par quartz |
| **Plateau de lecture:** | Aluminium moulé sous pression<br>Diamètre 30 cm |
| **Vitesses de la platine:** | 33-1/3 et 45 t/p.m.<br>Sélecteur de vitesse automatique<br>(Sélection manuelle possible) |
| **Pleurage et scintillement:** | 0,012% de valeur efficace*<br>0,025% de valeur efficace<br>(JIS C5521)<br>±0,035% de crête<br>(IEC 98A pondére) |

*Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

| | |
|---|---|
| **Ronflement:** | −56 dB (IEC 98A non pondéré)<br>−78 dB (IEC 98A pondéré) |

## ■ Section du bras de lecture

| | |
|---|---|
| **Type:** | Bras de lecture d'alignement linéaire de type à suspension à la cardan sur 4 pivots |
| **Longueur effective:** | 10,5 cm |
| **Erreur d'angle d'alignement:** | En deçà de ±0,1° |
| **Masse réelle:** | 9 g (y compris la cellule) |
| **Fréquence de résonance:** | 12 Hz |
| **Moteur d'entrainement du bras de lecture:** | Moteur C.C. |
| **Force verticale d'appui:** | 1,25 g (Fixé) |

## ■ Section de la cellule pick-up

| | |
|---|---|
| **No du modèle:** | EPC-P30 |
| **Type:** | Cellule pick-up stéréo à aimant mobile T4P |
| **Circuit magnétique:** | Noyau entièrement feuilleté |
| **Réponse en fréquence:** | 10 Hz à 40 kHz |
| **Tension de sortie:** | 2,5 mV à 1 kHz; 5 cm/s. zéro à vitesse latérale de crête<br>[7 mV à 1 kHz; 10 cm/s. zéro à vitesse 45° de crête<br>(DIN 45 500)] |
| **Séparation des canaux:** | 22 dB à 1 kHz |
| **Equilibrage des canaux:** | En deçà de 1,8 dB à 1 kHz |
| **Impédance de charge recommandée:** | 47 kΩ~100 kΩ |
| **Elasticité acoustique: (dynamique)** | $12 \times 10^{-6}$ cm/dyne à 100 Hz |
| **Plage de la force verticale d'appui:** | 1,25±0,25 g (12,5±2,5 mN) |
| **Poids:** | 6 g (cellule seule) |
| **Remplacement de la pointe de lecture:** | EPS-30ES<br>(Pointe de lecture ellipsoïdale) |

## ■ Généralités

| | |
|---|---|
| **Alimentation:** | Alternatif 220 V, 50 Hz |
| **Consommation:** | 13W |
| **Dimensions: (L × H × P)** | 43 × 9 × 35 cm<br>(Hauteur maximum lorsque le couvercle protège-poussière est ouvert: 39 cm) |
| **Poids:** | 5,1 kg |

Sujet à changement sans prearis.

# ESPECIFICACIONES

## ■ Sección del plato giratorio

| | |
|---|---|
| **Type:** | Sistema de plato giratorio automático con accionamiento directo por cuarzo |
| **Ventajas:** | Comienzo/descenso automáticos<br>Retorno automático<br>Parada automatica<br>Ejecución repetida<br>Ejecución con selección directa de la música<br>Ejecución con salto hacia adelante y hacia atrás<br>Ejecución con búsqueda hacia adelante y hacia atrás<br>Ejecución con búsqueda hacia adelante y hacia atrás<br>Selección automática del tamaño<br>Detección de presencia de disco |
| **Método de accionamiento:** | Accionamiento directo |
| **Motor:** | Motor de corriente continua sin escobillas |
| **Método de control de accionamiento:** | Control enclavado de fase de cuarzo |
| **Platillo del plato giratorio:** | Aluminio fundido<br>30 cm de diámetro |
| **Velocidades del plato giratorio:** | 33-1/3 y 45 rpm<br>Selección automática de la velocidad<br>(También posibilidad de seleccionar a mano) |
| **Ululaciones y trémolo:** | 0,012% WRMS*<br>0,025% WRMS (JIS C5521)<br>±0,035% cresta<br>(IEC 98A Ponderado) |

*Medido obteniendo una señal proveniente del generador de frecuencias incorporado del conjunto del motor.

| | |
|---|---|
| **Ruido de rodadura:** | −56 dB (IEC 98A No ponderado)<br>−78 dB (IEC 98A Ponderado) |

## ■ Sección del brazo sonoro

| | |
|---|---|
| **Tipo:** | Brazo sonoro de seguimiento lineal con suspensión cardánica de 4 pivotes |
| **Longitud efectiva:** | 10,5 cm |
| **Angulo de error de seguimiento:** | Inferior a 0,1° aproxim. |
| **Masa efectiva:** | 9 g (incluyendo el cartucho) |
| **Frecuencia de resonancia:** | 12 Hz |
| **Motor de accionamiento del brazo sonoro:** | Motor de corriente continua |
| **Presión de la aguja:** | 1,25 g (fija) |

## ■ Sección del cartucho

| | |
|---|---|
| **Núm. del modelo:** | EPC-P30 |
| **Tipo:** | Cartucho estereofónico de imán móvil T4P |
| **Circuito magnético:** | Núcleo totalmente laminado |
| **Respuesta de frecuencia:** | 10 Hz a 40 kHz |
| **Voltaje de salida:** | 2,5 mV a 1 kHz<br>Velocidad lateral de cero a cresta de 5 cm/s<br>(7 mV a 1 kHz, Velocidad de 45° de cero a cresta de 10 cm/s<br>[DIN 45 500]) |
| **Separación de canales:** | 22 dB a 1 kHz |
| **Equilibrio de canales:** | Inferior a 1,8 dB a 1 kHz |
| **Impedancia de carga recomendada:** | 47 kΩ a 100 kΩ |
| **Elasticidad (dinámica):** | $12 \times 10^{-6}$cm/dina a 100 Hz |
| **Radio de presión de la aguja:** | 1,25±0,25 g (12,5±2,5 mN) |
| **Peso:** | 6 g (cartucho solamente) |
| **Aguja de recambio:** | EPS-30ES<br>(Aguja elíptica) |

## ■ En general

| | |
|---|---|
| **Alimentación de corriente:** | ~110-127/220-240V,<br>50 ó 60 Hz |
| **Consumo de corriente:** | 13W |
| **Dimensiones: (Ancho×Alto×Prof.)** | 43 × 9 × 35 cm<br>(Altura máxima cuando la tapa contra el polvo está abierta: 39 cm) |
| **Peso:** | 5,1 kg |

Estas especificaciones están sujetas a cualquier cambio sin previo eviso.

## ■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

### ● Verwendete Geräte und Zustand des Gerätes

1. Oszilloskop
2. Gleichstrom-Voltmeter
3. Plate (SFTR007) für Justierung
4. Den Empfindlichkeits-Wahlschalter des optischen Sensors auf "M" stellen.

| Schritt | Gegenstand | Vorbereitungen für die Justierung | Zu justierende Teile | Justiermethode |
|---|---|---|---|---|
| 1 | **Startposition** | 1) Das Gehäuseoberteil öffnen und die Platte auflegen.<br>2) Den Ein/Aus-Schalter einschalten.<br>3) Den Startschalter drücken. | Absenk-positions-Justier1) | 1) Die Startposition-Justierschraube drehen. Falls er zwischen Musikstücken absenkt, die Schraube entgegen dem Uhrzeigersinn drehen. |
| 2 | **Uhrfrequenz** | 1) Leistungsdraht mit Klemme an IC301, Stift 29 und Stift 1 der Betriebs-Platine anschließen.<br>2) Das Oszilloskop and IC301 Stift 18 anschließen. | VR301 **(Abb. 2)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) VR301 so justieren, daß der Zyklus der Ausgangswellenform 1,6 msec. ±0,06 msec. beträgt. **(Abb. 3)** |
| 3 | **Sensorver-stärkung** | 1) Das Gleichstrom-Voltmeter an IC401, Stift 12 (+) und Masse (−) anschließen.<br>2) Die Platte für Justierung mit Seite A auflegen. | VR401 **(Abb. 2)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) Der Tonarm ist in der Ruheposition. (Unbespielter Teil der Platte.)<br>3) VR401 so abgleichen, daß die Ausgangsspannung 8,5±0,3V verträgt. |
| 4 | **Sensor-auflösung** | 1) Das Oszilloskop an IC401, Stift 9 (+) und Masse (−) anschließen.<br>2) Die Platte für Justierung mit Seite A auflegen. | VR402 **(Abb. 2)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) Den F-Überspring-Schalter gedrückt halten, um den Tonarm zu bewegen. (Ausgangsleistung tritt auf zwischen den Musikstücken.)<br>3) VR402 so abgleichen, daß die maximale Ausgangsleistung zwischen den Musikstücken 3V±0,3V beträgt. **(Abb. 4)** |
| 5 | **Nadel-Absenkposition** | 1) Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren.<br>2) Die Platte für Justierung mit Seite B auflegen.<br>3) Das Gehäuseoberteil schließen.<br>4) Das Gerät an den Verstärker anschließen. (Die Lautsprecher an die Lautsprecher-Anschlüsse anschließen.) | VR302 **(Abb. 5)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) Den F-Überspring-Schalter zweimal drücken und dann die Start-Taste drücken.<br>3) Nach beendetem Absenken den B-Überspring-Schalter nochmals drücken, zum Zwecke des Absenkens, wie bereits erwähnt.<br>4) Überprüfen, daß die Absenkposition bei "18~19" liegt.<br>5) VR302 so justieren, daß die Absenk-position bei "18~19" auf der Skala ist. |
| 6 | **Tonarm-Spurfehlwinkel** | 1) Die Staubabdeckung entfernen. (Siehe "ANLEITUNG FÜR DIE DEMONTAGE".)<br>2) Das Gehäuseoberteil öffnen und den Gehäuseschalte mit Klebband in der gebrückten Stellung arretieren.<br>3) Das Gehäuseoberteil schließen.<br>4) Eine Platte auflegen. | Justierschraube **(Abb. 6)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) Den F-Überspring-Schalter gedrückt halten, um den Tonarm zu bewegen.<br>3) Die Justierschraube so weit drehen, daß die Tonarmmitte mit der V-Kerbe der Liftstange übereinstimmt. |
| 7 | **Servo-Verstärkung und Offsetspannung** | 1) Die Staubabdeckung entfernen. (Siehe "ANLEITUNG FÜR DIE DEMONTAGE".)<br>2) Das Gehäuseoberteil öffnen und den Gehäuseschalter mit Klebband in der gedrückten Stellung arretieren.<br>3) Das Gleichstrom-Voltmeter an CN301, Stift 5 (+) und Stift 2 (−) anschließen.<br>4) Die Sensorabdeckung entfernen. | VR501 (Servo Verstärkung) Schraube (Offset-Spannung) **(Abb. 7)** | 1) Den Ein/Aus-Schalter einschalten.<br>2) Den F-Überspring-Schalter gedrückt halten, um den Tonarm zu bewegen.<br>3) Das Gehäuseoberteil öffnen.<br>4) Den Tonarm ganz nach links bewegen. Dann VR501 so justieren, daß die Spannung 6,0V beträgt. (Servo-Verstärkung)<br>5) Den Tonarm zur Mitte him stellen und überüfen, daß die Ausgangsspannung 3,0V beträgt.<br>6) Falls die Spannung nicht 3,0V betragt, ist die Schraube so zu justieren, daß die Ausgansspannung 3,0V beträgt. (Offset-Spannung) |

## ■ MESURAGES ET RÉGLAGES — Français

### ● Equipement utilisé et conditions de service de l'appareil

1. Oscilloscope
2. Voltmètre à C.C.
3. Disque (SFTR007) pour la mise au point
4. Régler le sélecteur de sensibilité de détecteur optique sur "M".

| Etape | Artiele | Préparatifs pour la réglage | Portion du réglage | Méthode de mise au point |
|---|---|---|---|---|
| 1 | **Position de démarrage** | 1) Ouvrir la boîtier supérieur et installer un disque.<br>2) Mettre en circuit l'interrupteur d'alimentation.<br>3) Appuyer sur la touche "Start" (mise en marche). | Vis d'ajustement de la position descendante. **(Fig. 1)** | 1) Tourner la vis de réglage du positionnement de démarrage. Si elle descend entre les plages, la tourner dans le sens inverse des aiguilles d'une montre. |
| 2 | **Fréquences des impulsions de rythme** | 1) Raccorder le fil de jonction avec attache à la broche 1 et à la broche 29 de IC301 du circuit de fonctionnement.<br>2) Raccorder l'oscilloscope à la broche 18 de IC301. | VR301 **(Fig. 2)** | 1) Mettre en circuit l'interrupteur d'alimentation.<br>2) Ajuster VR301 de telle sorte que le cycle de la forme d'onde de sortie soit de 1,6 msec. ±0,06 msec. **(Fig. 3)** |
| 3 | **Gain du dispositif dérecteur** | 1) Raccorder un voltmètre à C.C. aux 12 ergots (+) de IC401 et à la terre (−).<br>2) Installer le disque pour la mise au point avec le côté A vers le haut. | VR401 **(Fig. 2)** | 1) Mettre en marche l'interrupteur d'alimentation.<br>2) Le bras de lecture est à la position de repos. (Zone vierge du disque.)<br>3) Ajuste VR401 de telle sorte que la tension de sortie soit de 8,5V±0,3V. |
| 4 | **Résolution du dispositif détecteur** | 1) Raccorder l'oscilloscope aux 9 ergots (+) de IC401 et à la terre (−).<br>2) Installer le disque pour la mise au point avec le côté A vers la haut. | VR402 **(Fig. 2)** | 1) Mettre en circuit l'interrupteur d'alimentation.<br>2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture. (La puissance de sortie est déliverée entre les plages.)<br>3) Ajuster VR402 de telle sorte que la puissance de crête entre les plages soit de 3V±0,3V. **(Fig. 4)** |
| 5 | **Position de pose/ relevage de la pointe de lecture** | 1) Ouverir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>2) Installer le disque pour la mise au point avec le côté B vers le haut.<br>3) Refermer le boîtier supérieur.<br>4) Raccorder l'appareil à o'amplificateur. (Raccorder les haut-parleurs aux bornes des hautparleurs.) | VR302 **(Fig. 5)** | 1) Mettre en circuit l'interrupteur d'alimentation.<br>2) Appuyer deux fois sur le commutateur de saut F, puis appuyer sur le commutateur de mise en route.<br>3) Après l'achèvement de la pose/relevage, appuyer à nouveau sur le commutateur de saut B en vue de la pose, comme il a été mentionné auparavant.<br>4) S'assurer que la position descendante est au comptage de "18~19".<br>5) Régler VR302 de telle sorte que la position descendante soit au comptage de "18~19". |
| 6 | **Angle de décalage du bras de lecture** | 1) Retirer le couvercle protège-poussière. (Se référer aux "INSTRUCTIONS POUR LE DÉMONTAGE".)<br>2) Ouvrir la boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>3) Refermer le boîtier supéreur.<br>4) Installer un disque. | Vis de réglage **(Fig. 6)** | 1) Mettre en circuit l'interrupteur d'alimentation.<br>2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture.<br>3) Tourner la vis de réglage de façon à ce que le centre de bras cincide avec la rainure en V de la tige d'élévation. |
| 7 | **Amplification servo-mécanique et tension d'écart de réglage** | 1) Retirer le couvercle protège-poussière. (Se référer aux "INSTRUCTIONS POUR LE DÉMONTAGE".)<br>2) Ouvrir le boîtier supérieur et maintenir appuyée la touche du boîtier avec une bande adhésive.<br>3) Raccorder le voltmètre à C.C. à la broche 5 (+) et à la broche 2 (−) de CN301.<br>4) Retirer le couvercle du dispositif détecteur. | VR501 (Amplification servo-mécanique) Plaquette à Vis. (Tension de décalage) **(Fig. 7)** | 1) Mettre en circuit l'interrupteur d'alimentation.<br>2) Maintenir enfoncé le commutateur de saut F pour déplacer le bras de lecture.<br>3) Ouvrir le boîtier supérieur.<br>4) Déplacer complètement le bras de lecture vers la gauche. Puis, ajuster VR501 de telle sorte que la tension soit de 6,0V. (Amplification servo-mécanique)<br>5) Régler le bras de lecture au centre et s'assurerque la tension de sortie soit de 3,0V.<br>6) Si la tension n'est pas de 3,0V, ajuster la vis de telle sorte que la tension de sortie soit de 3,0V. (Tension de décalage) |

## ■ MEDICIONES Y AJUSTE Español

### • Equipos usados y estado del aparato

1. Osciloscopio
2. Voltímetro de corriente continua
3. Disco (SFTR007) de ajuste
4. Poner el selector de sensibilidad del sensor óptico en "M".

| Paso | Punto tratado | Preparativos para el ajuste | Porción a ajuster | Manera de hacer el ajuste |
|---|---|---|---|---|
| 1 | **Posición de arranque** | 1) Abrir el gabine superior y colocar el disco.<br>2) Encender el interruptor de la corriente.<br>3) Empujar el interruptor de arranque ("Start"). | Tornillo de regulación de la posición de descenso **(Fig. 1)** | 1) Hacer girar el tornillo de regulación de la posición de decenso. Si se deposita en medio de una pieza, girar el tornillo hacia la izquierda. |
| 2 | **Frecuencia del reloj** | 1) Conectar el hilo conductor con clip a 29 pernos y 1 perno de IC301 de tablero de circuitos de operación.<br>2) Conectar el osciloscopio al pasador 18 de IC301. | VR301 **(Fig. 2)** | 1) Encender el interruptor de la corriente.<br>2) Regular VR301 de manera que el ciclo de forma de onda de salida sea 1,6 mseg. ±0,06 mseg. **(Fig. 3)** |
| 3 | **Ganancia del sensor** | 1) Conectar el voltímetro de CC a 12 pernos (+) de IC401 y tirra (−).<br>2) Colocar el disco de ajuste con el lado A mirando hacia arriba. | VR401 **(Fig. 2)** | 1) Encender el interruptor de la corriente.<br>2) El brazo sonoro está en la posición de descanso. (Area negra del disco.)<br>3) Regular VR401 de manera tel que la tensión de salida sea de 8,5V ±0,3V. |
| 4 | **Resolución del sensor** | 1) Conectar el osciloscopio a 9 pernos (+) de IC401 y tirra (−).<br>2) Colocar el disco de ajuste con el lado A mirando hacia arriba. | VR402 **(Fig. 2)** | 1) Encender el interruptor de la corriente.<br>2) Mantener el interruptor de salto F oprimido para mover el brazo sonoro. (La salida se suministra entre las piezas.)<br>3) Regular VR402 de manera tal que la salida de cresta entre las piezas sea de 3V±0,3V. **(Fig. 4)** |
| 5 | **Posición de descenso de aguja.** | 1) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>2) Colocar el disco de ajuste con el lado B mirando hacia arriba.<br>3) Cerrar el gabinete superior.<br>4) Conectar el aparato al amplificador. (Conectar los altoparlantes a los bornes para conexión de los mismos.) | VR302 **(Fig. 5)** | 1) Encender el interruptor de la corriente.<br>2) Apretar el interruptor de salto F dos veces y luego apretar el interruptor de arranque.<br>3) Después de completar el descenso, de nuevo apretar el interruptor de salto B con el fin de descenso como mencionado previamente.<br>4) Asegurarse de que la posición de descenso se encuentre el el número "18~19".<br>5) Regular VR302 de manera que la posición de descenso esté en conteo "18~19". |
| 6 | **Angulo de descentramiento del brazo sonoro** | 1) Remover la tapa contra el polvo. (Referir a "INSTRUCCION DE DESMONTAJE".)<br>2) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>3) Cerrar el gabinete superior.<br>4) Colocar el disco. | Tornillo de ajuste **(Fig. 6)** | 1) Encender el interruptor de la corriente.<br>2) Manetener el interruptor de salto F oprimido para mover el brazo sonoro.<br>3) Girar el tornillo de ajuste de manera tal que el centro del brazo concuerde con la ranura en V de la barra de elevación. |
| 7 | **Canancia del servomecanismo y tensión de desnivel** | 1) Remover la tapa contra el polvo. (Referir a "INSTRUCCION DE DESMONTAJE".)<br>2) Abrir el gabinete superior y sujetar el interruptor del mismo con cinta.<br>3) Conectar el voltímetro de CC a 5 pernos (+) y 2 pernos (−) de CN301.<br>4) Remover la cubierta de sensor. | VR501 (Ganancia del servo-mecanismo)<br>Tornillo (Tensión de densnivel) **(Fig. 7)** | 1) Encender el interruptor de la corriente.<br>2) Mantener el interruptor de salto F oprimido para mover el brazo sonoro.<br>3) Abrir el gabinete superior.<br>4) Mover completamente el brazo sonoro a la izquierda. Luego, regular VR501 de manera que la tensión sea 6,0V. (Ganancia del servomecanismo.)<br>5) Colocar el brazo sonoro en el centro y asegurarse de que la tension de salida sea de 3,0V.<br>6) Si la tensión no es 3,0V, regular el tornillo de manera que la tensión de salida sea 3,0V. (Tensión de desnivel) |

## ■ CHANGE IN REPLACEMENT PARTS LIST

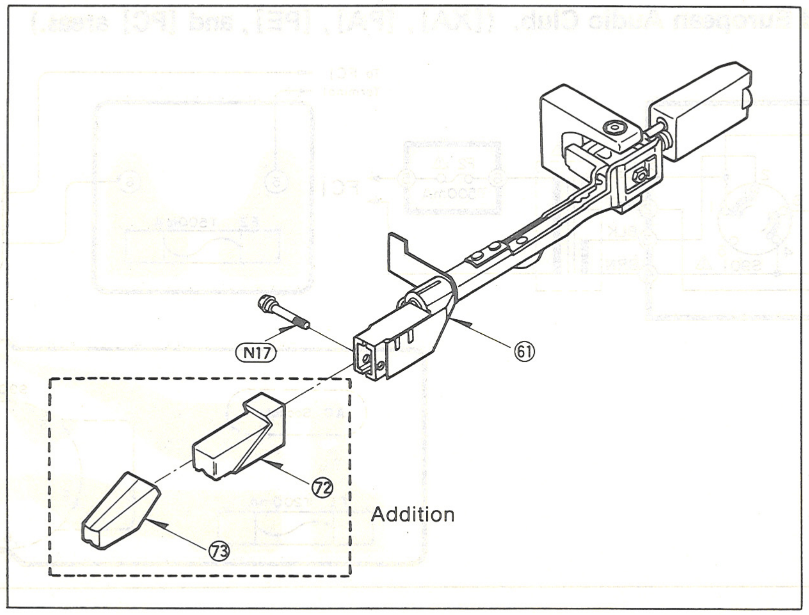
**Notes:**

1. Mentioned in this parts list are only those changes in Model No. SL- L 2 for destination [M] area.
2. Important safety notice:
   Components identified by a ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black only, while ○-marked parts are for silver type only.
4. Parts other than Ⓚ-and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

| Ref. No. | Change of Part |  | Area & Color | Part Name & Description |
|---|---|---|---|---|
|  | SL-L2 [M] | ➡ SL-L2/(K) |  |  |
| **SWITCHES** |  |  |  |  |
| S901 | Addition | **SFDSHXW225-3** | [XA, PA, PE, PC] only | Voltage Selector ⚠ |
| **POWER TRANSFORMERS** |  |  |  |  |
| T1 | SLT48DTL3A | **SLT48DTE13E** | [EK, XL] | Power Source ⚠ |
|  |  | **SLT57DT7E** | [XA, PA, PE, PC] |  |
|  |  | **SLT48DT10E** | [other] |  |
| **FUSES** |  |  |  |  |
| F1 | Addition | **XBA2C02T1B** | [XA, PA, PE, PC] only | 250V, T200mA ⚠ |
|  |  | **XBA2C05T1B** | [other] | 250V, T500mA ⚠ |
| F2 | Addition | **XBA2C05T1B** | [XA, PA, PE, PC] only | 250V, T500mA ⚠ |
| **CABINET AND CHASSIS PARTS** |  |  |  |  |
| 1 | SFADC11M01E | **SFADC11N01E** |  | Dust Cover |
| 5 | SFACC12N01E | **SFACC12N01E** | ○ | Cabinet |
|  |  | **SFACC12N21E** | Ⓚ |  |
| 5-1 | SFKBBD2N01 | **SFKBBD2N01** | ○ | Badge |
|  |  | **SFKBBD2N21** | Ⓚ |  |
| 6 | SFGCQ06N02 | **SFGCQ06X01** | [XA, PA, PE, PC] | Rubber Cushion |
|  |  | **SFGCQ06N02** | [other] |  |
| 7 | SFKKC12N01 | **SFKKC12S01** |  | Ornament Plate |
| 43 | SFACC13N011 | **SFACC13N011** | ○ | Cover |
|  |  | **SFACC13N211** | Ⓚ |  |
| 44 | SFNNC12M01 | **SFNNC12X01** | [XA] | Name Plate |
|  |  | **SFNNC12R01** | [EG] |  |
|  |  | **SFNNC12P02** | [PC] |  |
|  |  | **SFNNC12S01** | [E, EC] |  |
|  |  | **SFNNC12G01** | [EK, XL] |  |
|  |  | **SFNNC12P01** | [PA, PE] |  |
|  |  | **SFNNC12Q01** | [other] |  |
| 45 | SFDJHSC0491 | **SFDJHSC0491** | [XL] | AC Socket ⚠ |
|  |  | **SFDJHSC04912** | [XA, PA, PE, PC] |  |
|  |  | **SFDJHSC0516** | [other] |  |

| Ref. No. | Change of Part |  | Area & Color | Part Name & Description |
|---|---|---|---|---|
|  | SL-L1 [M] | ➡ SL-L1/(K) |  |  |
| 60 | SFACC13N012 | **SFACC13N012** | Except for [XA, PA, PE, PC] ○ | Cover |
|  |  | **SFACC13N212** | Except for [XA, PA, PE, PC] Ⓚ |  |
| **TONEARM PARTS** |  |  |  |  |
| 72 | Addition | **EPC-P33** | [PA, PE, PC] | ★ Cartridge |
|  |  | **EPC-P30** | [other] |  |
| 73 | Addition | **EPS-33ES** | [PA, PE, PC] | ★ Stylus |
|  |  | **EPS-30ES** | [other] |  |
| **ACCESSORIES** |  |  |  |  |
| A1 | SFNUC12M01 | **SFNUC12G01** | [EK] | Instruction Book |
|  |  | **SFNUC12I01** | [Ei] |  |
|  |  | **SFNUC12P01** | [PA, PE, PC] |  |
|  |  | **SFNUC12S01E** | [E, EB, EH, EC] |  |
|  |  | **SFNUC12X01** | [other] |  |
| A4 | SFDAC05M02 | **SFDAC05G02** | [EK] | AC Cord ⚠ |
|  |  | **SFDAC05L01** | [XL] |  |
|  |  | **SFDAC05X02** | [XA] |  |
|  |  | **SFDAC05N01** | [PA, PE, PC] |  |
|  |  | **SFDAC05E02** | [other] |  |
| A5 | Addition | **SFDKI19118** | [XA] only | Plug ⚠ |
| A6 | Addition | **QJP0603S** | [PA, PE, PC] only | Adaptor ⚠ |
| **PACKING PARTS** |  |  |  |  |
| P1 | SFHPC12M01 | **SFHPC12C01** | [EF] only ○ | Carton Box |
|  |  | **SFHPC12M01** | [other] ○ |  |
|  |  | **SFHPC12F21** | [EF] only Ⓚ |  |
|  |  | **SFHPC12S21** | [other] Ⓚ |  |

### • Addition of cartridge and stylus



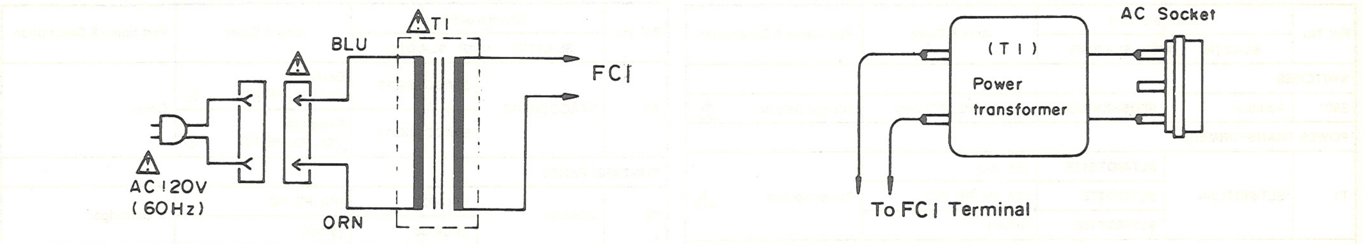
# SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARD

**Important safety notice:**

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.

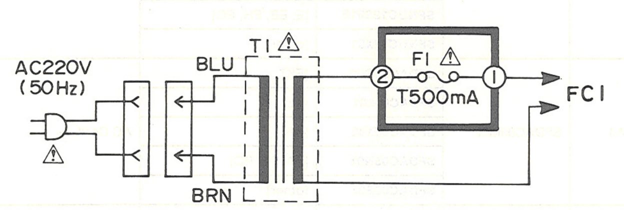
- **Change in power source circuit**

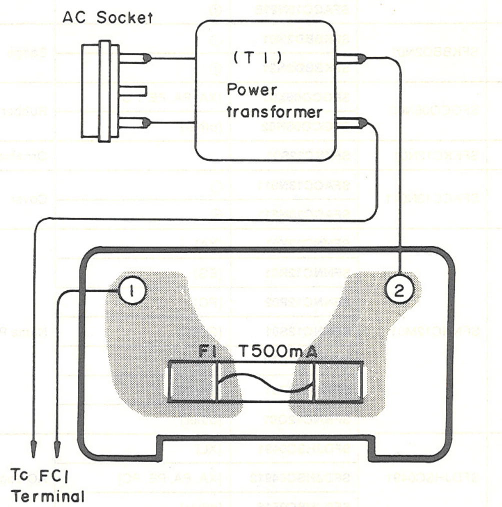
**Product for U.S.A. ([M] area)**



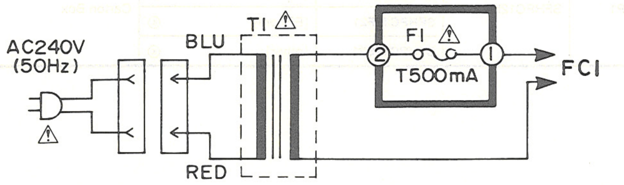
**Change**

**Product for Continental Europe ([E], [EG], [EB], [EH], [EF], [Ei] and [EC] areas.)**

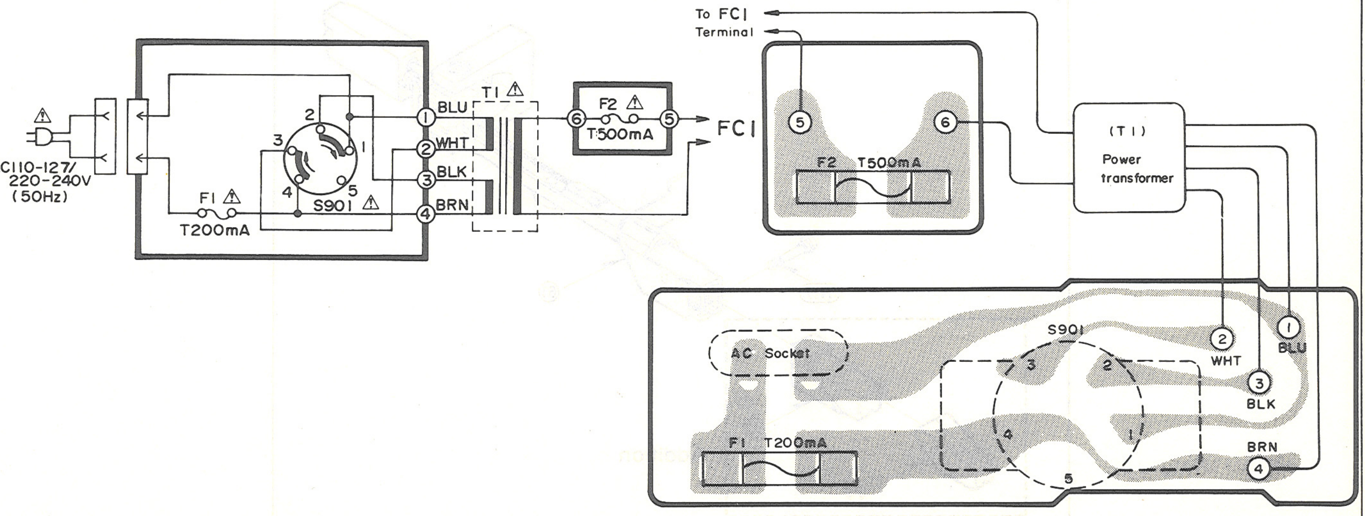




**Product for United Kingdom and Australia ([EK] and [XL] areas)**



**Product for Southeast Asia, Occania, Africa, Middle Near East, Central South America, Far East PX, European Military and European Audio Club. ([XA], [PA], [PE], and [PC] areas.)**



# REPLACEMENT PARTS LIST

**Notes:**

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ-and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

| Ref. No. | Part. No. | Description |
|---|---|---|
| **INTEGRATED CIRCUIT** | | |
| IC1 | AN7812 | Regulator |
| IC101 | AN6638 | Turntable Drive |
| IC201 | AN6683 | Turntable Control |
| IC301 | MN1420FPQ | Microcomputer |
| IC302 | AN6914 | Comparator |
| IC401 | AN6690 | Arm Motor Drive & Blank Groove Detection |
| **TRANSISTOR** | | |
| Q1 | 2SC1383 | Regulator |
| Q2, 401 | 2SD638 | Regulator |
| Q301, 303, 308, 311 | 2SD636 | Switching |
| Q302 | 2SD892 | Switching |
| Q305, 306, 309, 310, 312 | 2SB641 | Switching |
| **DIODE** | | |
| D1~4 | ⚠ SVD1SR35200V | Rectifier |
| D5 | MA4056 | 5.6V Zener |
| D6~9 | SVDAY5525S | LED |
| D10 | MA4100 | 10V Zener |
| D301~303, 305, 306, 312, 402, 403 | MA 165 | Switching |
| D307, 310 | SVDGL-9HY82 | LED |
| D308 | MA4062 | 6.2V Zener |
| D309 | SVDGL-9PG2 | LED |
| D311 | LN513RAM | LED |
| D401 | MA4068 | 6.8V Zener |
| D501, 701 | Ⓢ MA162A | Switching |
| D502 | SVDSLV31VC3 | LED |
| **CRYSTAL** | | |
| X201 | SVQSH41TR | 4.193 MHz |
| **VARIABLE RESISTOR** | | |
| VR301 | EVN61AA00B24 | Clock Frequency Adjustment, 20 kΩ(B) |
| VR302 | EVJE1AF20B54 | Stylus Cue-down Position Control, 50 kΩ(B) |
| VR401 | EVN61AA00B55 | Sensor Gain Adjustment, 500kΩ(B) |
| VR402 | EVN61AA00B25 | Sensor Resolution Adjustment, 200kΩ(B) |
| VR501 | EVNK0AA00B14 | Servo Gain Adjustment, 10kΩ(B) |
| **RELAY** | | |
| RL701 | SFDYQ11N02 | Muting |
| **SWITCH** | | |
| S1 | ⚠ SFDSC02N02 | Power |
| S901 [XA, PA, PE, PC] only | ⚠ SFDSHXW225-3 | Voltage Selector |
| S301~306 | EVQQS405K | Operation |
| S307 | SFDSC05N01 | Reset |
| S308, 309, 401 | SFDSHSW08314 | Size, Speed and Sens Selector |
| S601 | SFDSC02N03 | Rest position |
| **PHOTO INTERRUPTER** | | |
| PC501 | 0N1186 | Offset Angle Sensor |
| PC502 | SFPABJ0205R | Blank Groove Sensor |
| PC601 | 0N1161 | Tonearm Position Sensor |
| **HALL ELEMENT** | | |
| H101, 102 | 0H-002 | Turntable Position Detector |
| **POWER TRANSFORMER** | | |
| T1 [EK, XL] | ⚠ SLT48DTE13E | Power Source |
| T1 [XA, PA, PE, PC] | ⚠ SLT57DT7E | Power Source |
| T1 [other] | ⚠ SLT48DT10E | Power Source |
| **FUSE** | | |
| F1 [XA, PA, PE, PC] | ⚠ XBA2C02T1B | 250V, T200 mA |
| F1 [other] | ⚠ XBA2C05T1B | 250V, T500 mA |
| F2 [XA, PA, PE, PC] only | ⚠ XBA2C05T1B | 250V, T500 mA |
| **CABINET AND CHASSIS PARTS** | | |
| 1 | SFADC12N01E | Dust Cover (1) |
| 1-1 | SFGZJ02N01 | Rubber Cushion (2) |
| 2 | SFGZC02N01 | Rubber Cushion (2) |
| 3 | SFUMC02N14 | Latch, Dust cover (2) |
| 4 | SFUMQ06N22 | Latch, Dust cover (2) |
| 5 | ○ SFACC12N01E | Cabinet (1) |
| 5 | Ⓚ SFACC12N21E | Cabinet (1) |
| 5-1 | ○ SFKBBD2N01 | Badge (1) |
| 5-1 | Ⓚ SFKBBD2N21 | Badge (1) |
| 6 [XA, PA, PE, PC] | SFGCQ06X01 | Rubber Cushion (2) |
| 6 [other] | SFGCQ06N02 | Rubber Cushion (2) |
| 7 | SFKKC12S01 | Ornament Plate (1) |
| 8 | SRKTK15N26 | Knob, Power (1) |
| 10 | SFKTC13N01 | Knob, Operation (1) |
| 11 | SFUPC13N01 | Guide (1) |
| 13 | SFUMC13N01 | Holder (1) |
| 14 | SFGBC10-01 | Belt, Tonearm Drive (1) |
| 15 | SFUMQ06N06A | Worm Ass'y (1) |
| 16 | SFMHC02N02R | Motor, Tonearm Drive (1) |
| 17 | SFUMC02N07 | Motor Cover (1) |
| 18 | SFUMC02N05 | Lever, Rest Switch (1) |
| 19 | SFUMQ06N09 | Holder, Rest Switch (1) |
| 20 | SFUZC05N02E | Rope Ass'y (1) |
| 21 | SFXJQ06N01 | Guide Rail (1) |
| 22 | SFUMQ06N07 | Clamper, Guide Rail (1) |
| 23 | SFGCQ06N01 | Cushion, Guide Rail (1) |
| 24 | SFUMC02N06 | Base, Rest Switch (1) |
| 25 | SFUPBL3N11E | Base, Motor (1) |
| 26 | SFUML11R03 | Wheel, Tonearm Drive (1) |
| 27 | SFUMC02N10 | Holder, Lead Wire (1) |
| 28 | SFUZC02N01 | Rod, Rest Switch (1) |
| 29 | SFUMC02N12 | Holder, Lead Wire (1) |
| 30 | SFUMV05N23 | Cap (1) |
| 31 | SFATQ06N01E | Hinge (2) |
| 32 | SFUKC13N01E | Base (1) |
| 33 | SFGCQ06N03 | Rubber Cushion, Dust Cover (2) |
| 34 | SFGCC05N05 | Cushion, Guide Rail (1) |
| 35 | SFUMC05N22 | Pulley (1) |
| 36 | SFQCC05N01 | Spring, Insulator (4) |
| 37 | SFGAJ02N01 | Insulator (4) |
| 38 | SFAUC13N01 | Bottom Cover (1) |
| 39 | SFDJC13N03E | Connector Ass'y (1) |
| 40 | SFKTC13N01 | Knob, Selectors (3) |
| 41 | SFKTQ06N02 | Knob, Cueing Down Position Control (1) |
| 42 | SFUMC05N15 | Holder, Rest Switch (1) |
| 43 | ○ SFACC13N011 | Cover (1) |
| 43 | Ⓚ SFACC13N211 | Cover (1) |
| 44 [XA] | SFNNC12X01 | Name Plate (1) |
| 44 [EG] | SFNNC12R01 | Name Plate (1) |
| 44 [PC] | SFNNC12P02 | Name Plate (1) |
| 44 [E, EC] | SFNNC12S01 | Name Plate (1) |
| 44 [EK, XL] | SFNNC12G01 | Name Plate (1) |
| 44 [PA, PE] | SFNNC12P01 | Name Plate (1) |
| 44 [other] | SFNNC12Q01 | Name Plate (1) |
| 45 [XL] | ⚠ SFDJHSC0491 | AC Socket (1) |
| 45 [XA, PA, PE, PC] | ⚠ SFDJHSC04912 | AC Socket (1) |
| 45 [other] | ⚠ SFDJHSC0516 | AC Socket (1) |
| 46 | SFDJJ02N04E | Jack, Phono Output (1) |
| 47 | SFWEC06N01 | 45 rpm Adaptor (1) |
| 48 | SFQAC06N01 | Spring (1) |
| 49 | SFTGQ06N01 | Turntable Mat (1) |
| 50 | SFTEQ05N01 | Turntable Platter (1) |
| 51 | SFTMC07-01E | Rotate Magnet, Turntable Platter (1) |
| 52 | SFMGQ34N01 | Cover, Stator Coil (1) |
| 53 | SFMZC06N01R | Stator Frame Ass'y (1) |
| 54 | SFDJC13N02E | Connector, Ass'y (1) |
| 55 | SFGKQ06N01 | Cap (1) |
| 56 | SFQA913-01 | Spring (1) |
| 57 | SFQHQ34N22 | Spring (1) |
| 58 | SFQPC05N01 | Spring, Rest Switch (1) |
| 59 | SFUMC13N03 | Prism (1) |
| 60 | ○ SFACC13N012 | Cover (1) |
| 60 | Ⓚ SFACC13N212 | Cover (1) |

| Ref. No. | Part. No. | Description | |
|---|---|---|---|
| **TONEARM PARTS** | | | |
| 61 | SFPAMJ0201A | Tonearm Ass'y | (1) |
| 62 | SFPKDJ0201R | Tonearm Base | (1) |
| 62-1 | SFPSP00504 | Spring | (1) |
| 63 | SFPGML1101 | Rubber, Guide | (2) |
| 65 | SFPABJ0205R | Sensor Ass'y | (1) |
| 66 | SFDZC05N01E | Solenoid Ass'y | (1) |
| 67 | SFPCS0Q601 | Cover, Sensor Case | (1) |
| 68 | SFPAK0Q601 | Plate | (1) |
| 69 | SFPCSJ0201 | Case | (1) |
| 70 | SFPGM0Q601 | Rubber | (1) |
| 71 | SFPSP00302 | Spring, Adjustment | (2) |
| **72** [PA, PE, PC] | EPC-P33 | ★ Cartridge | (1) |
| **72** [other] | EPC-P30 | ★ Cartridge | (1) |
| **73** [PA, PE, PC] | EPS-33ES | ★ Stylus | (1) |
| **73** [other] | EPS-30ES | ★ Stylus | (1) |
| **SCREWS, WASHERS AND NUTS** | | | |
| N1 | SFXGQ06N01 | Screw | (2) |
| N2 | ⓢ XTV3+10BFN | Screw, ⊕3×10 | (11) |
| N3 | XTW3+14TFZ | Screw, ⊕3×14 | (2) |
| N4 | XTV3+6JFZ | Screw, ⊕3×6 | (4) |
| N5 | XTW3+14QFYR | Screw, ⊕3×14 | (6) |
| N6 | XSN3+30S | Screw, ⊕3×30 | (1) |
| N7 | XWE3D10 | Washer, ϕ3 | (1) |
| N8 | XNC3HS | Nut | (2) |
| N9 | CSTW3 | Washer | (2) |
| N10 | XWE3A8BW | Washer | (1) |
| N11 | XTV3+20J | Screw, ⊕3×20 | (1) |
| N12 | XTN16+10G | Screw, ⊕1.6×10 | (1) |
| N13 | ⓢ XTV3+6BFN | Screw, ⊕3×6 | (4) |
| N14 | SFXWC06N02 | Washer | (1) |
| N15 | ⓢ XSN3+5S | Screw | (3) |
| N16 | SFPEV0Q601 | Screw, Cartridge | (1) |
| N17 | XTS26+6JFZ | Screw, ⊕2.6×6 | (1) |
| N18 | XYN2+C4FZ | Screw, ⊕2×4 | (1) |
| N19 | SFXN623-1 | Nut | (1) |
| N20 | SFPTN00301 | Screw | (1) |
| N21 | XSN3+12S | Screw, ⊕3×12 | (1) |
| N22 | XWA3B | Washer, ϕ3 | (1) |
| N23 | XTN23+6JFZ | Screw, ⊕2.3×6 | (1) |
| N24 | XTV3+8BFZ | Screw, ⊕3×8 | (1) |
| **ACCESSORIES** | | | |
| **A1** [EK] | SFNUC12G01 | Instruction Book | (1) |
| **A1** [Ei] | SFNUC12I01 | Instruction Book | (1) |
| **A1** [PA, PE, PC] | SFNUC12P01 | Instruction Book | (1) |
| **A1** [E, EB, EH, EC] | SFNUC12S01E | Instruction Book | (1) |
| **A1** [other] | SFNUC12X01 | Instruction Book | (1) |
| A2 | SFDHC05N01 | Phono Output Cord | (1) |
| A3 | SFDLJ02N11E | Ground Wire | (1) |
| **A4** [EK] | ⚠SFDAC05G02 | AC Cord | (1) |
| **A4** [XL] | ⚠SFDAC05L01 | AC Cord | (1) |
| **A4** [XA] | ⚠SFDAC05X02 | AC Cord | (1) |
| **A4** [PA, PE, PC] | ⚠SFDAC05N01 | AC Cord | (1) |
| **A4** [other] | ⚠SFDAC05E02 | AC Cord | (1) |
| A5 [XA] only | ⚠SFDKI19118 | Plug | (1) |
| A6 [PA, PE, PC] only | ⚠QJP0603S | Adaptor | (1) |
| **PACKING PARTS** | | | |
| **P1** [EF] only | ○ SFHPC12C01 | Carton Box | (1) |
| **P1** [other] | ○ SFHPC12M01 | Carton Box | (1) |
| **P1** [EF] only | Ⓚ SFHPC12F21 | Carton Box | (1) |
| **P1** [other] | Ⓚ SFHPC12S21 | Carton Box | (1) |
| P2 | SFHHC13N01 | Pad, Front | (1) |
| P3 | SFHHC13N02 | Pad, Rear | (1) |
| P4 | SFHKC05N01 | Clamper, Turntable Platter | (2) |
| P5 | SFHKQ06N01 | Spacer, Tonearm | (1) |
| P6 | SFHSC13N01 | Spacer, Dust Cover | (1) |
| P7 | SFYH60×60 | Polyethylene Bag | (1) |
| P8 | SFYH17×16 | Polyethylene, Cord | (1) |
| P9 | SFYF33B35 | Polyethylene, Turntable Mat | (1) |
| P10 | SFHDD04N01 | Pad, Turntable Mat | (1) |

| Color | Areas | Color | Areas |
|---|---|---|---|
| (S) (K) | [E] ..... Switzerland and Scandinavia. | (S) (K) | [XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America. |
| (S) (K) | [EK] .... United Kingdom. | | |
| (S) (K) | [XL] .... Australia. | | |
| (S) (K) | [EG] ... F.R. Germany. | | |
| (S) (K) | [EB] .... Belgium. | (S) (K) | [PA] .... Far East PX. |
| (S) (K) | [EH] .... Holland. | (S) (K) | [PE] .... European Military. |
| (S) (K) | [EF] .... France. | (S) (K) | [PC] .... European Audio Club. |
| (S) (K) | [Ei] ..... Italy. | | |
| (S) (K) | [EC] .... Czechoslovakia. | | |

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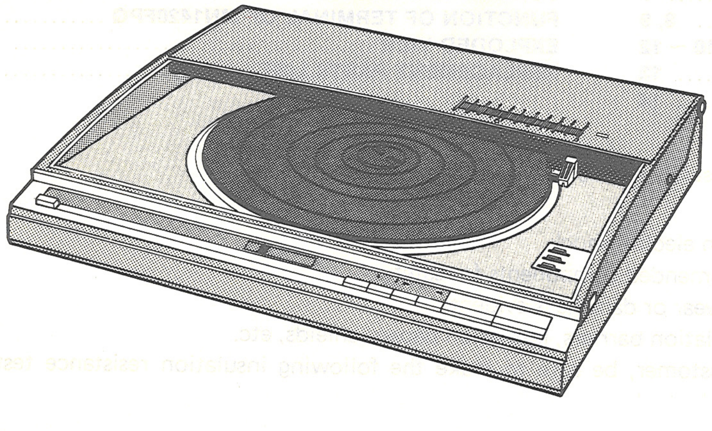
A2

# Service Manual

## Turntable System
## SL-L2



**Color**

(S)...Silver Type

**Area**

[M]........U.S.A.
[MC] ......Canada

T4P is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

## SPECIFICATIONS

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

### ■ Turntable section

| | |
|---|---|
| **Type:** | Quartz direct drive<br>Fully automatic turntable system |
| **Features:** | Auto start/Auto lead-in<br>Auto return<br>Auto stop<br>Repeat play<br>Direct music select play<br>Forward and backward skip play<br>Forward and backward search play<br>Auto size select<br>Record presence detection |
| **Drive method:** | Direct drive |
| **Motor:** | Brushless DC motor |
| **Drive control method:** | Quartz-phase-locked control |
| **Turntable platter:** | Aluminum die-cast<br>Diameter 30 cm (12") |
| **Turntable speeds:** | 33-1/3 rpm and 45 rpm<br>Auto speed select<br>(Manual selection possible) |
| **Wow and flutter:** | 0.012% WRMS*<br>0.025% WRMS (JIS C5521)<br>±0.035% peak<br>(IEC 98A Weighted) |

*Measured by obtaining signal from built-in frequency generator of motor assembly.

| | |
|---|---|
| **Rumble:** | −56 dB (IEC 98A Unweighted)<br>−78 dB (IEC 98A Weighted) |

### ■ Tonearm section

| | |
|---|---|
| **Type:** | Linear tracking tonearm<br>4-pivot gimbal suspension T4P |
| **Effective length:** | 10.5 cm (4-1/8") |
| **Tracking error angle:** | Within ±0.1° |
| **Effective mass:** | 9 g (including cartridge) |
| **Resonance frequency:** | 12 Hz |
| **Tonearm drive motor:** | DC motor |
| **Stylus pressure:** | 1.25 g (Fixed) |
| **Applicable cartridge weight:** | 6 g |
| **Phono cable capacitance:** | 150 pF |

### ■ General

| | |
|---|---|
| **Power supply:** | AC 120 V, 60 Hz |
| **Power consumption:** | 14W |
| **Dimensions: (W × H × D)** | 43 × 9 × 35 cm<br>(16-15/16" × 3-17/32" × 13-25/32")<br>(Maximum height when the dust cover is open.)<br>39 cm (15-11/32") |
| **Weight:** | 5.1 kg (11.2 lb.) |

Technics

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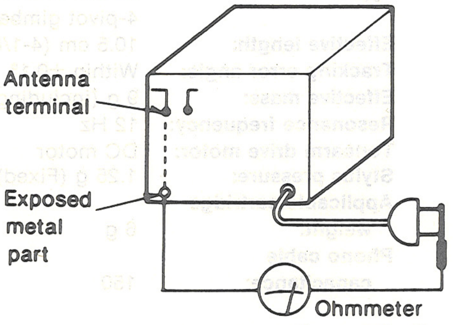
## ■ SAFETY PRECAUTION (This "safety precaution" is applied only in the U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

### ● INSULATION RESISTANCE TEST

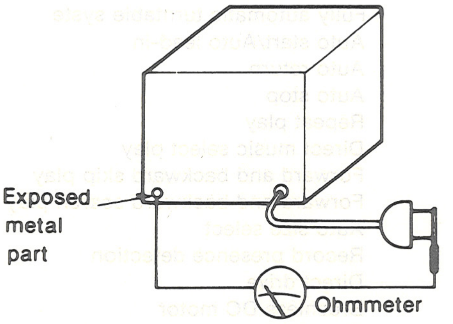
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

**Note:** Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

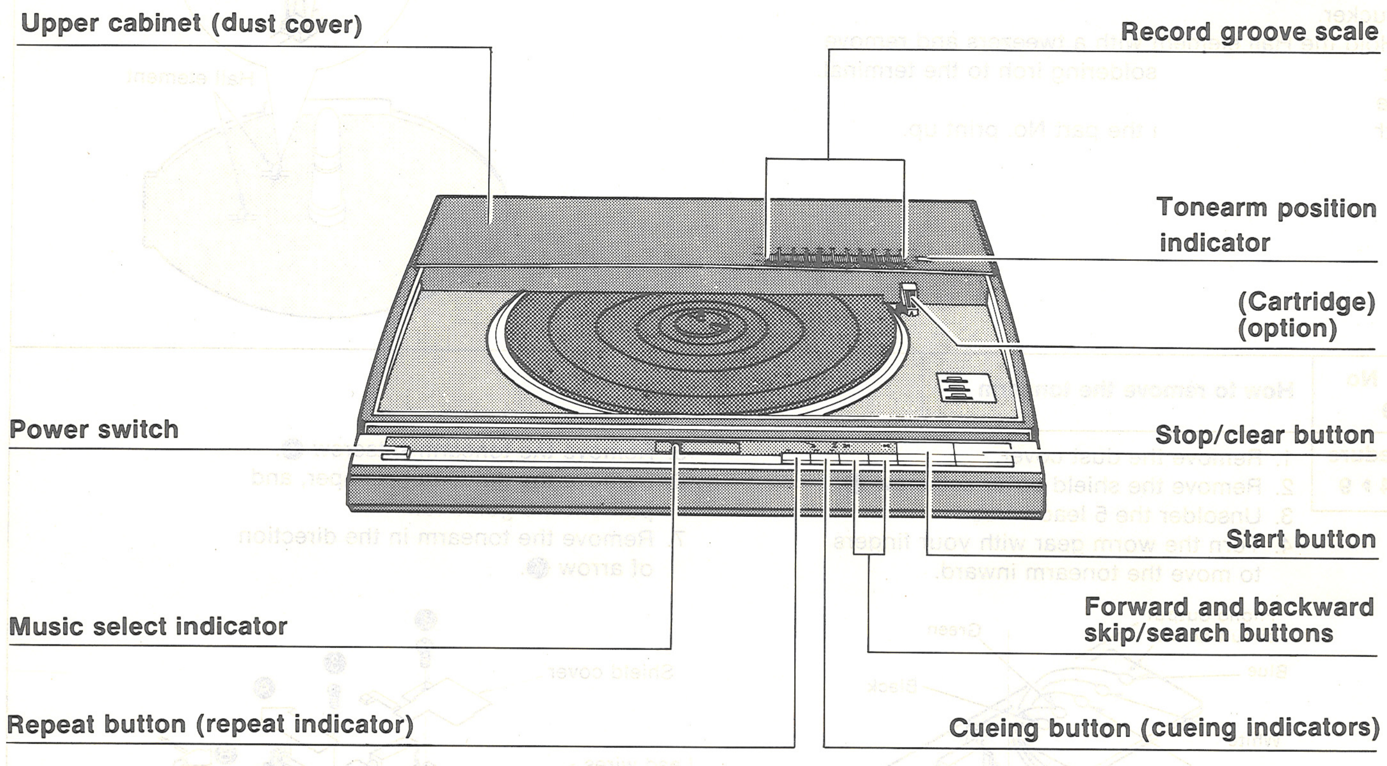


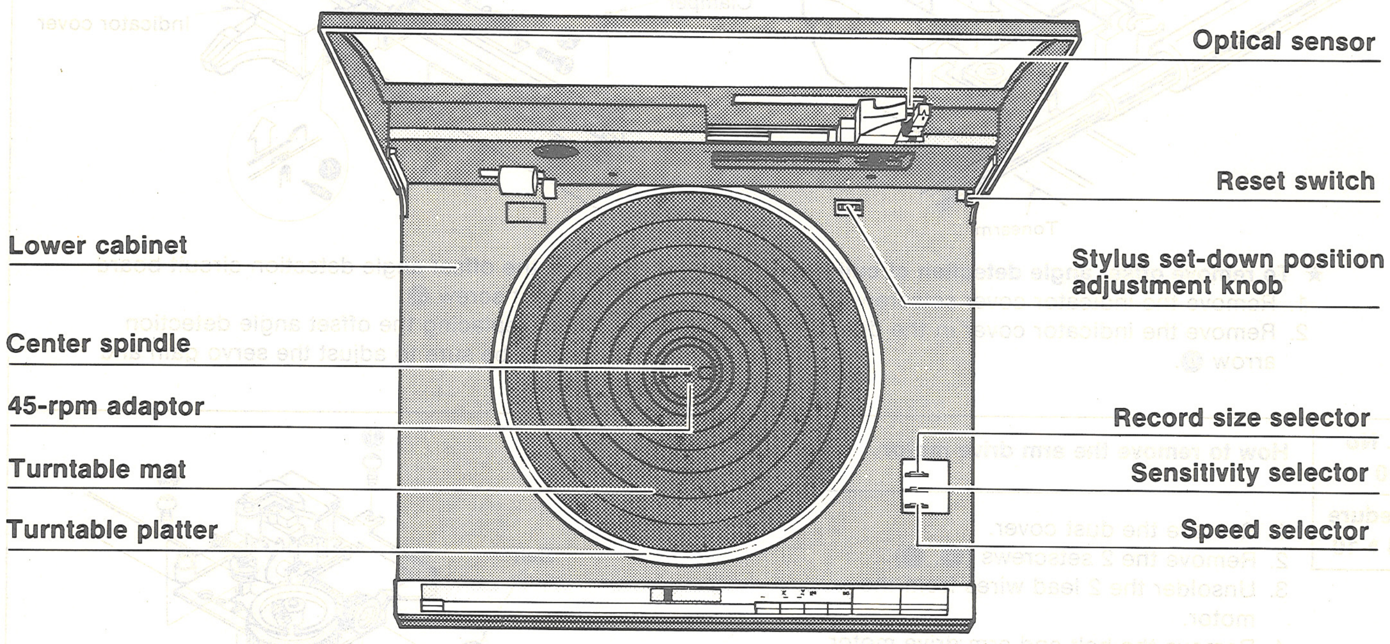
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

## ■ LOCATION OF CONTROLS


Upper cabinet (dust cover)
Record groove scale
Tonearm position indicator
(Cartridge) (option)
Power switch
Stop/clear button
Start button
Music select indicator
Forward and backward skip/search buttons
Repeat button (repeat indicator)
Cueing button (cueing indicators)


Optical sensor
Reset switch
Lower cabinet
Stylus set-down position adjustment knob
Center spindle
45-rpm adaptor
Record size selector
Turntable mat
Sensitivity selector
Turntable platter
Speed selector

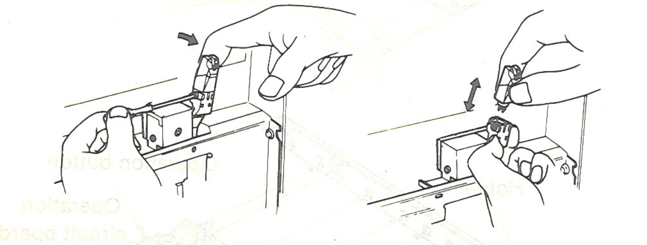
## ■ DISASSEMBLY INSTRUCTIONS

**Ref. No 1** — **How to remove the cartridge**

**Procedure 1**

1. Open the upper cabinet.
2. Remove the setscrew and pull out the cartridge.

**Note:** When attaching the cartridge again, match the tonearm connector with the cartridge pin, then completely insert it and tighten the setscrew.



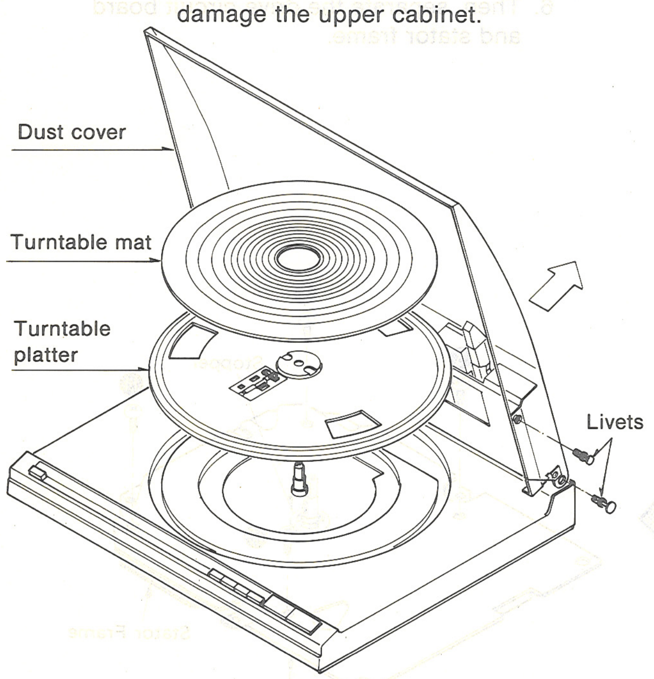
**Ref. No 2** — **How to remove the turntable platter**

**Procedure 2**

1. Open the upper cabinet.
2. Remove the turntable mat, and lift the turntable platter.

**Note:**

- When removing the turntable platter, it is not necessary to remove the 45 rpm adaptor.
- The turntable platter is tightly fitted to the center spindle. When removing the turntable platter, take care not to damage the upper cabinet.


Dust cover
Turntable mat
Turntable platter
Livets

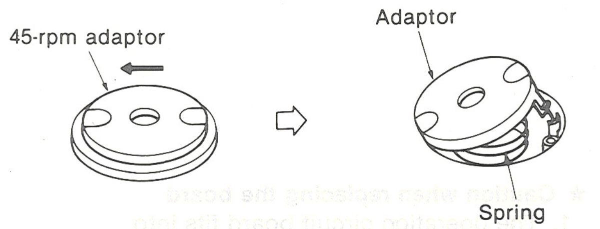
★ **To remove the dust cover**

1. Pull out the 4 right and left rivets.
2. Remove the dust cover in the direction of the arrow.

**Ref. No 3** — **How to remove the 45 rpm adaptor**

**Procedure 2 ▸ 3**

- The 2 adaptor claws fit into the turntable platter, so remove the 45 rpm adaptor by pushing it in the direction of the arrow.

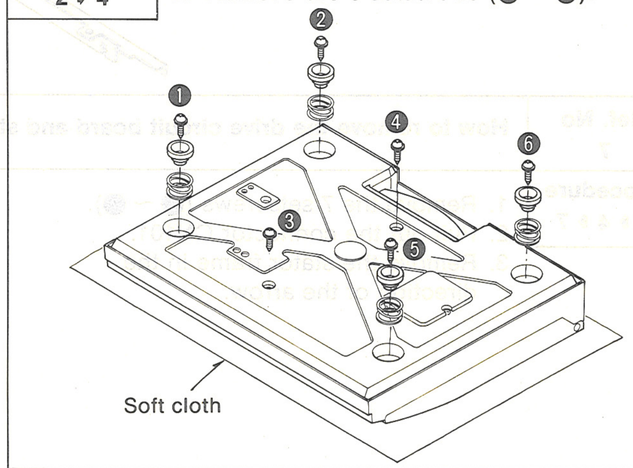

45-rpm adaptor
Adaptor
Spring

**Note:** When removing the 45 rpm adaptor, remove the turntable platter; otherwise the 45 rpm adaptor claws will be broken.

**Ref. No 4** — **How to remove the bottom board**

**Procedure 2 ▸ 4**

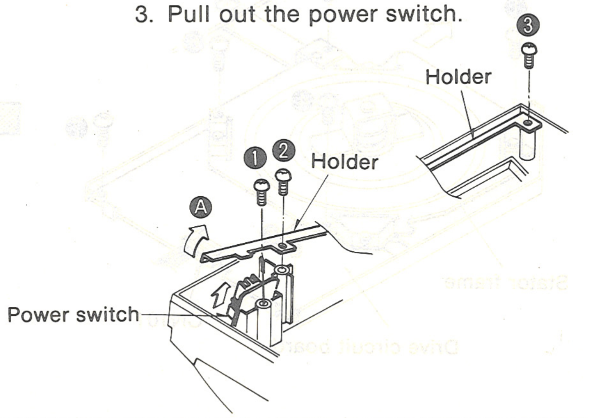
1. Turn over the unit on a soft cloth.
2. Remove the 6 setscrews (❶ ~ ❻).


❶
❷
❸
❹
❺
❻
Soft cloth

**Ref. No 5** — **How to remove the power switch**

**Procedure 2 ▸ 4 ▸ 5**

1. Remove the 3 setscrews (❶ ~ ❸).
2. Lift the holder slightly in the direction of arrow Ⓐ.
3. Pull out the power switch.

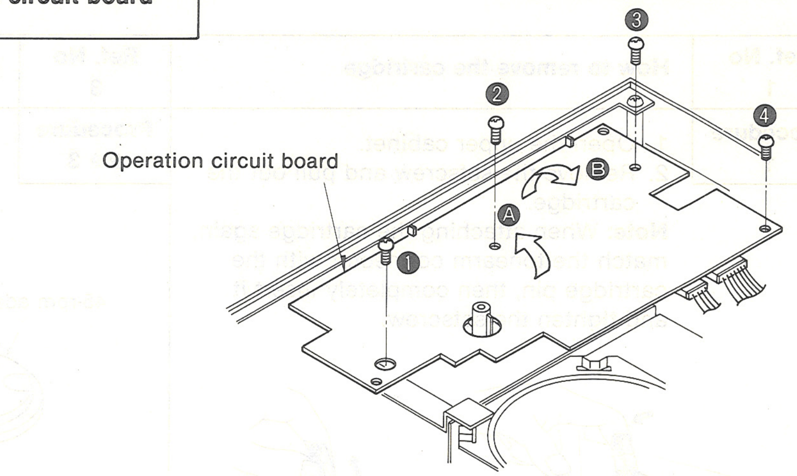

❸
Holder
❶ ❷
Holder
Ⓐ
Power switch

**Ref. No 6**

## How to remove the operation circuit board

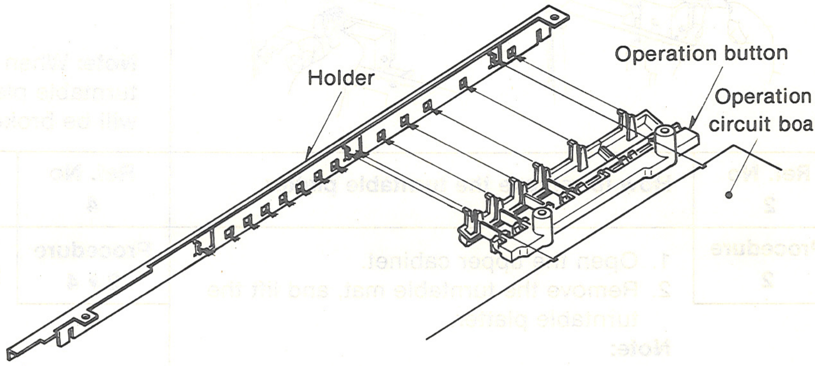
**Procedure 2 ▸ 4 ▸ 6**

1. Remove the 4 setscrews (① ~ ④).
2. Remove the operation circuit board in the direction of arrows (Ⓐ, Ⓑ).


③
②
④
Operation circuit board
Ⓑ
Ⓐ
①

**★ Caution when replacing the board**

1. The operation circuit board fits into guide rails.
2. Match the operation button to the hole in the holder.

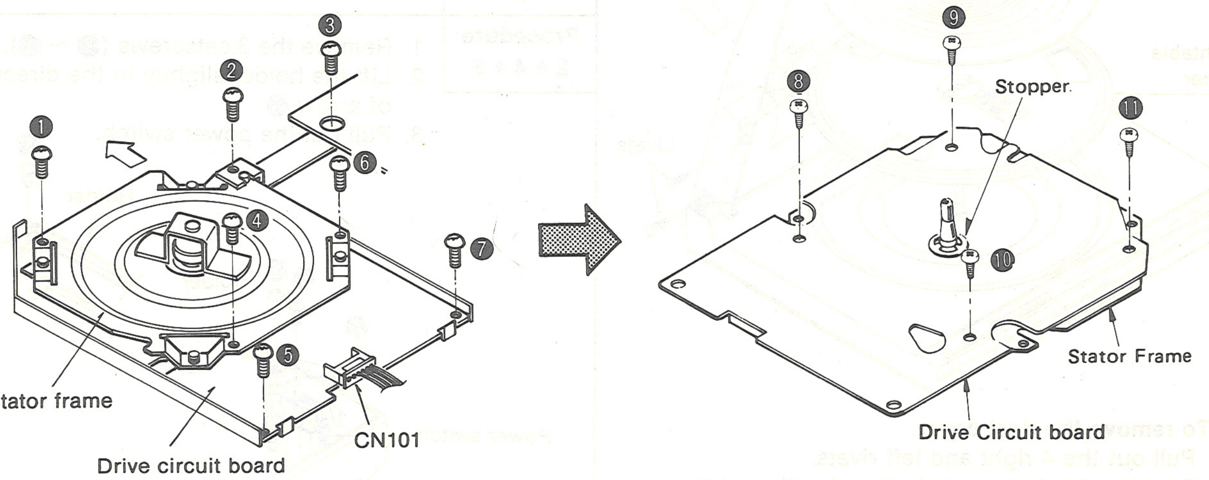

Holder
Operation button
Operation circuit board

**Ref. No 7**

## How to remove the drive circuit board and stator frame

**Procedure 2 ▸ 4 ▸ 7**

1. Remove the 7 setscrews (① ~ ⑦).
2. Pull out the connector CN101.
3. Remove the stator frame in the direction of the arrow.
4. Cut off the stopper with nippers.
5. Remove the 4 setscrews (⑧ ~ ⑪).
6. Then, separate the drive circuit board and stator frame.


③
②
①
⑥
④
⑦
⑤
Stator frame
Drive circuit board
CN101
⑨
⑧
Stopper
⑪
⑩
Stator Frame
Drive Circuit board

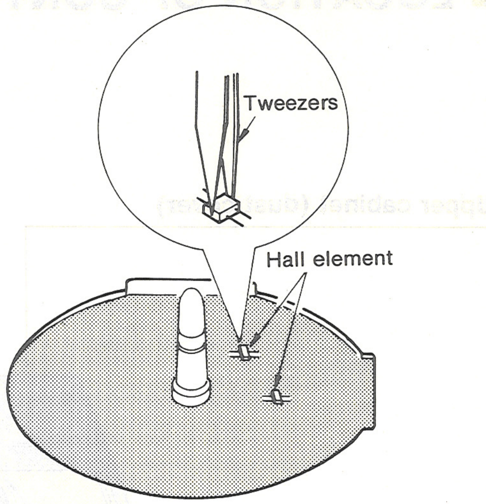
**Ref. No 8**

## How to remove the Hall element

**Procedure 2 ▸ 8**

1. Remove the terminal solder by use of solder sucker.
2. Hold the Hall element with a tweezers and remove it while touching the soldering iron to the terminal.

**Note:**
Fit the Hall element with the part No. print up.

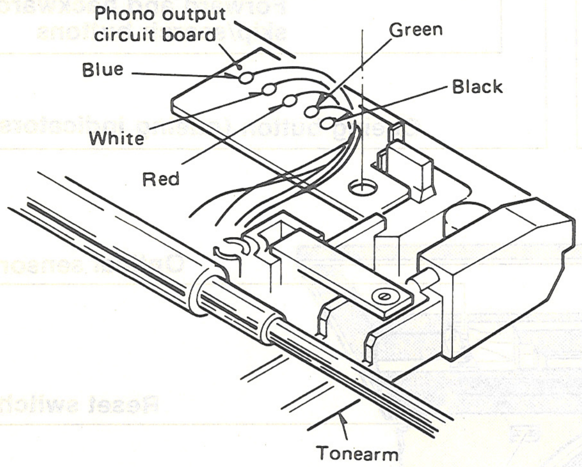

Tweezers
Hall element

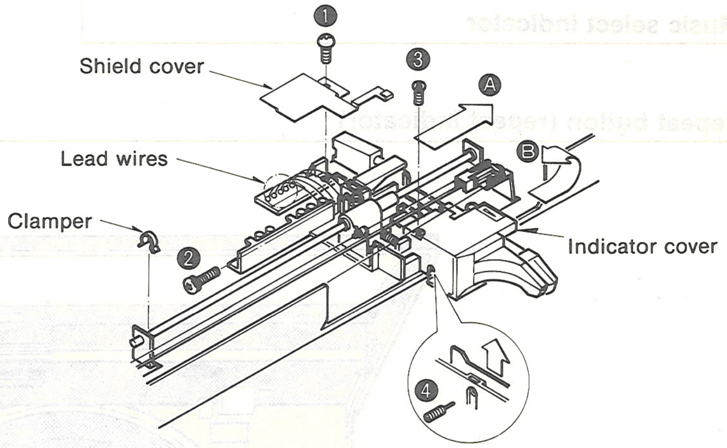
**Ref. No 9**

## How to remove the tonearm

**Procedure 2 ▸ 4 ▸ 9**

1. Remove the dust cover.
2. Remove the shield cover setscrew ①.
3. Unsolder the 5 lead wires.
4. Turn the worm gear with your fingers to move the tonearm inward.
5. Remove the tonearm setscrew ②.
6. Remove the guide rail clamper, and pull out the guide rail.
7. Remove the tonearm in the direction of arrow Ⓐ.


Phono output circuit board
Green
Blue
Black
White
Red
Tonearm


①
Shield cover
③
Ⓐ
Lead wires
Ⓑ
Clamper
②
Indicator cover
④

**★ To remove offset angle detection circuit board**

1. Remove the indicator cover setscrew ③.
2. Remove the indicator cover in the direction the arrow Ⓑ.
3. Remove the offset angle detection circuit board adjustment screw ④.

**Note:** When replacing the offset angle detection circuit board, be sure to adjust the servo gain and offset voltage.

**Ref. No 10**

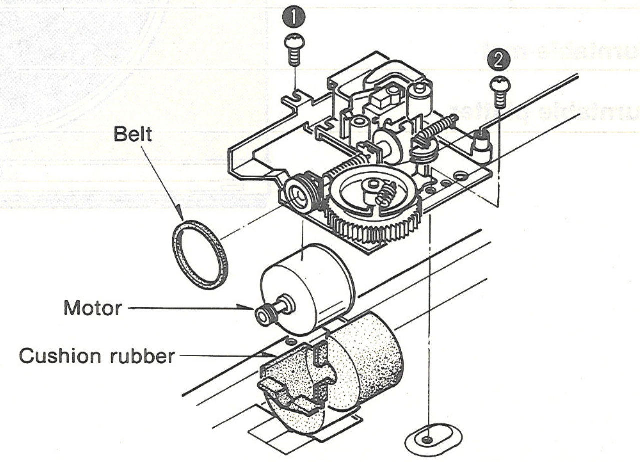
## How to remove the arm drive motor

**Procedure 2 ▸ 4 ▸ 10**

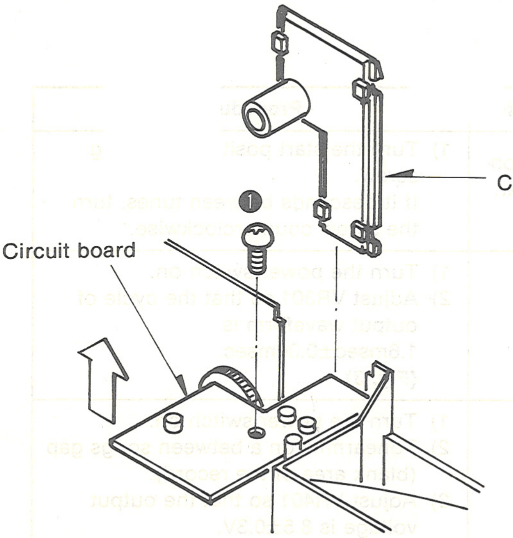
1. Remove the dust cover.
2. Remove the 2 setscrews (①, ②).
3. Unsolder the 2 lead wires from the motor.
4. Remove the belt and arm drive motor
5. Open the cushion rubber.

**Note:**
Connection of the arm drive motor
Red wire ........... (+) terminal of the arm drive motor.
Blue wire .......... (−) terminal of the arm drive motor.

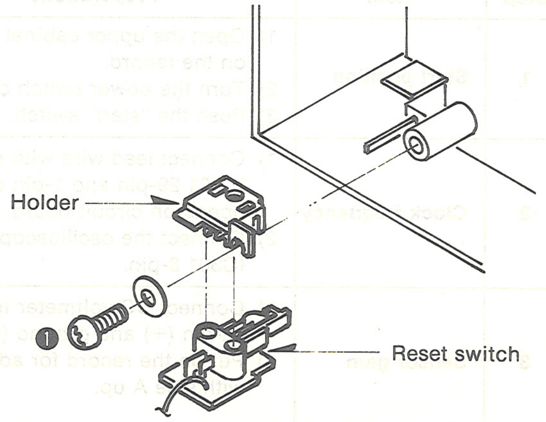
- An arrow mark is the (−) terminal.


①
②
Belt
Motor
Cushion rubber

| Ref. No 11 | How to remove the stylus set-down position volume circuit board |
|---|---|
| **Procedure**<br>2 ▸ 4 ▸ 11 | 1. Remove the cover.<br>2. Remove the stylus set-down position volume circuit board setscrew ❶. |



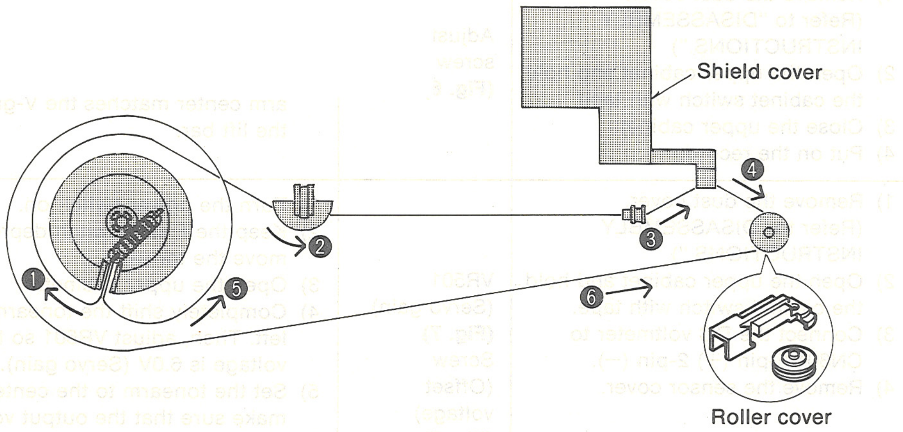
| Ref. No 12 | How to remove the reset switch |
|---|---|
| **Procedure**<br>2 ▸ 4 ▸ 12 | 1. Remove the screw ❶.<br>2. Remove the 2 claws of the switch holder.<br>3. Unsolder the 2 switch terminals.<br>**Note:**<br>When replacing the reset switch, be sure to open the upper cabinet. |



## ■ HOW TO SET THE TONEARM DRIVE ROPE

When setting the rope, follow the procedure given below.

1. Remove the dust cover and tonearm cover.
2. Remove the roller cover.
3. Set the rope in the order of steps 1 ~ 6.
4. Fit the rope connector to the tonearm.
5. Set the roller cover and turn the worm gear by hand to see that the tonearm moves.



# MEASUREMENTS AND ADJUSTMENTS

- **Equipment used and condition of the set**

1. Oscilloscope
2. DC voltmeter
3. Record (SFTR007) for adjustment
4. Set the optical sensor sensitivity selector to "**M**".

- **Caution**

To adjust servo gain and offset voltage.....

1. Remove the dust cover.
2. Disassembly the tonearm as in Fig. 7.

| Step | Item | Preparations | Parts adjusted | Procedure |
|---|---|---|---|---|
| 1 | **Start position** | 1) Open the upper cabinet and put on the record.<br>2) Turn the power switch on.<br>3) Push the "start" switch. | Start position adjust screw. **(Fig. 1)** | 1) Turn the start position adjusting screw. If it descends between tunes, turn the screw counterclockwise. |
| 2 | **Clock frequency** | 1) Connect lead wire with clip to IC301 29-pin and 1-pin of operation circuit board.<br>2) Connect the oscilloscope to IC301 8-pin. | VR301 **(Fig. 2)** | 1) Turn the power switch on.<br>2) Adjust VR301 so that the cycle of output waveform is 1.6msec±0.06msec. **(Fig. 3)** |
| 3 | **Sensor gain** | 1) Connect DC voltmeter to IC401 12-pin (+) and ground (−).<br>2) Put on the record for adjustment with side A up. | VR401 **(Fig. 2)** | 1) Turn the power switch on.<br>2) Tonearm is on a between songs gap (blank area of the record).<br>3) Adjust VR401 so that the output voltage is 8.5±0.3V. |
| 4 | **Sensor resolution** | 1) Connect the oscilloscope to the IC401 9-pin (+) and ground (−).<br>2) Put on the record for adjustment with side A up. | VR402 **(Fig. 2)** | 1) Turn the power switch on.<br>2) Keep the F skip switch depressed to move the tonearm. (Output is delivered between the tunes.)<br>3) Adjust VR402 so that the peak output between tunes is 3.0±0.3V. **(Fig. 4)** |
| 5 | **Stylus cue-down position** | 1) Open the upper cabinet and hold the cabinet switch with tape.<br>2) Put on the record for adjustment with side B up.<br>3) Close the upper cabinet.<br>4) Connect the unit to the amplifier (Connect the speakers to the speaker terminals.) | VR302 **(Fig. 5)** | 1) Turn the power switch on.<br>2) Press the F skip switch twice and then press the start switch.<br>3) After completion of cueing, again press the B skip switch to cue down.<br>4) Make sure that the descending position is at count "18~19". |
| 6 | **Tonearm offset angle** | 1) Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTIONS.")<br>2) Open the upper cabinet and hold the cabinet switch with tape.<br>3) Close the upper cabinet.<br>4) Put on the record. | Adjusting screw **(Fig. 6)** | 1) Turn the power switch on.<br>2) Keep the F skip switch depressed to move the tonearm.<br>3) Turn the adjusting screw so that the arm center matches the V-groove of the lift bar. |
| 7 | **Servo gain and offset voltage** | 1) Remove the dust cover. (Refer to "DISASSEMBLY INSTRUCTIONS.")<br>2) Open the upper cabinet and hold the cabinet switch with tape.<br>3) Connect the DC voltmeter to CN301 5-pin (+) 2-pin (−).<br>4) Remove the sensor cover. | VR501 (Servo gain) **(Fig. 7)**<br>Screw (Offset voltage) **(Fig. 7)** | 1) Turn the power switch on.<br>2) Keep the F skip switch depressed to move the tonearm.<br>3) Open the upper cabinet.<br>4) Completely shift the tonearm to the left. Then, adjust VR501 so that the voltage is 6.0V (Servo gain).<br>5) Set the tonearm to the center and make sure that the output voltage is 3.0V.<br>6) If the voltage is not 3.0V, adjust screw so that the output voltage is 3.0V (Offset voltage). |

## • Adjustment points

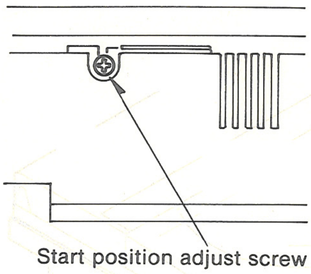

Start position adjust screw

Fig. 1

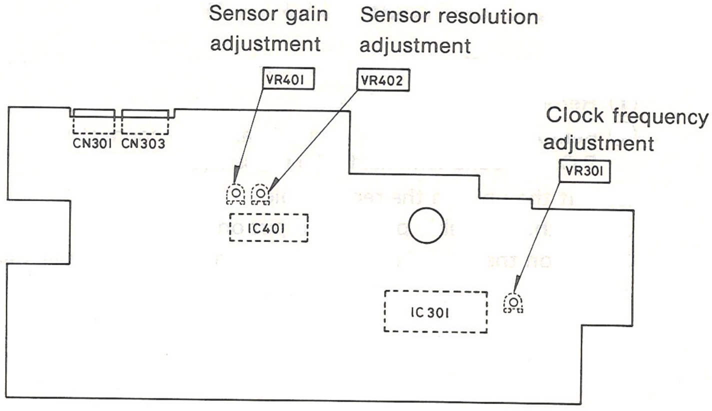

Sensor gain adjustment
VR401
Sensor resolution adjustment
VR402
Clock frequency adjustment
VR301
CN301
CN303
IC401
IC301

Fig. 2

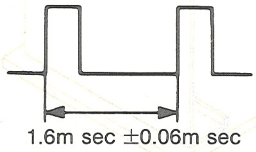


Fig. 3

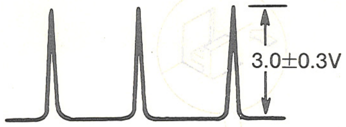


Fig. 4

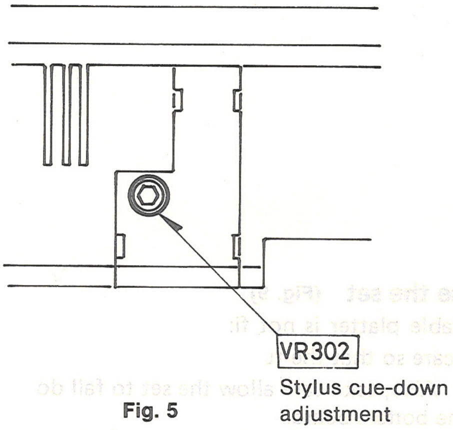

VR302
Stylus cue-down adjustment

Fig. 5

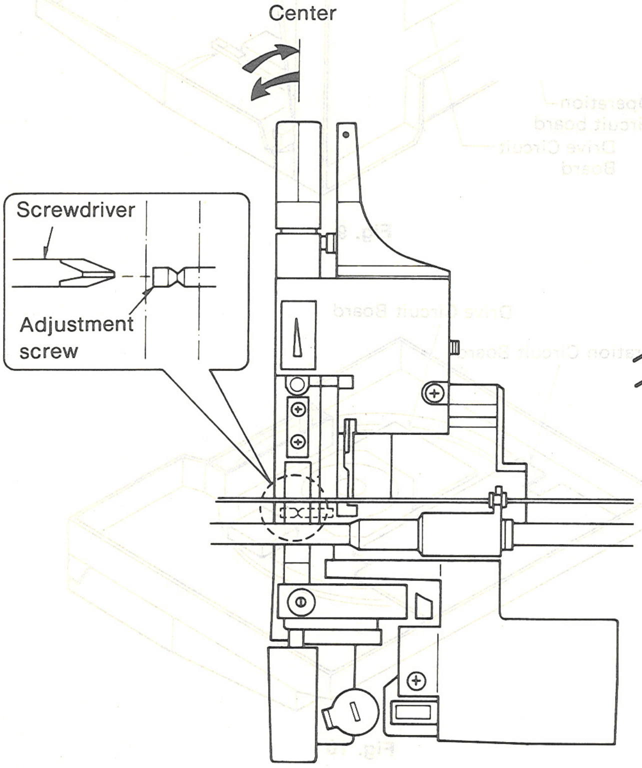

Center
Screwdriver
Adjustment screw

Fig. 6

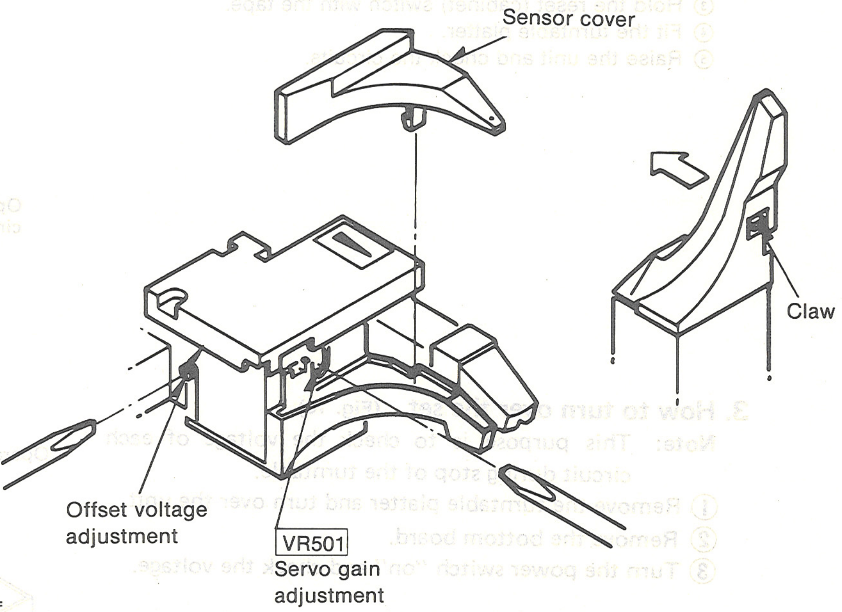

Sensor cover
Claw
Offset voltage adjustment
VR501
Servo gain adjustment

Fig. 7

# ■ TROUBLESHOOTING

## 1. How to use the repair table (Fig. 8)

① Remove the bottom board.
② Remove the operation circuit board and connect the P.C.B. ground terminal to the chassis (Stator frame.)
③ Put the unit on the repair table.
④ Fit the turntable platter and put on the turntable mat.
⑤ Put on the record and check the circuits from under the unit.

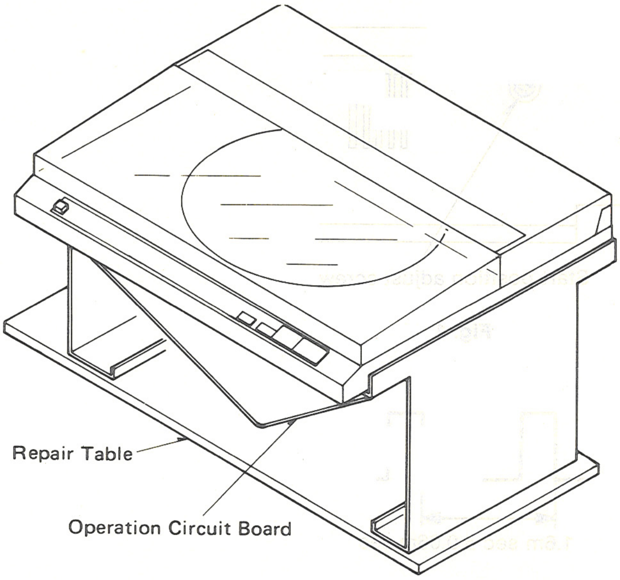

Repair Table
Operation Circuit Board

Fig. 8

## 2. How to raise the set (Fig. 9)

**Note:** Turntable platter is not fixed on the center spindle. Take care so that the turntable platter will not come loose. Also, take care allow the set to fall down.

① Remove the bottom board.
② Completely open the upper cabinet.
③ Hold the reset (cabinet) switch with the tape.
④ Fit the turntable platter.
⑤ Raise the unit and check the circuits.

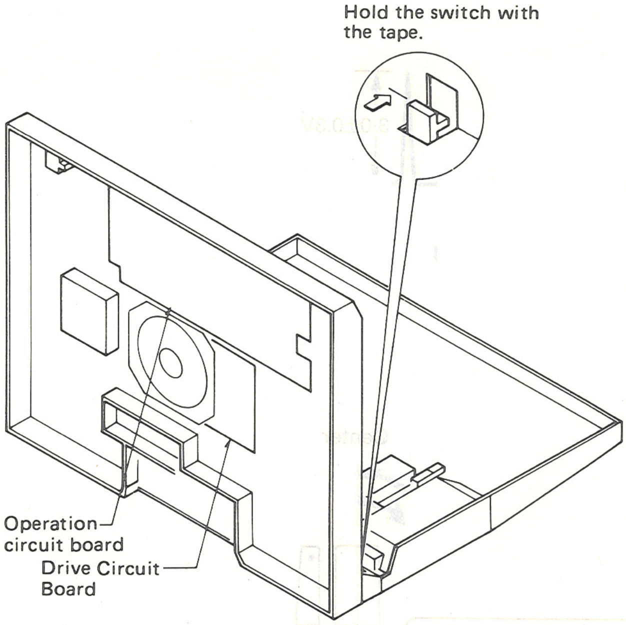

Hold the switch with the tape.
Operation circuit board
Drive Circuit Board

Fig. 9

## 3. How to turn over the set (Fig. 10)

**Note:** This purpose is to check the voltage of each circuit during stop of the turntable.

① Remove the turntable platter and turn over the unit.
② Remove the bottom board.
③ Turn the power switch "on" and check the voltage.

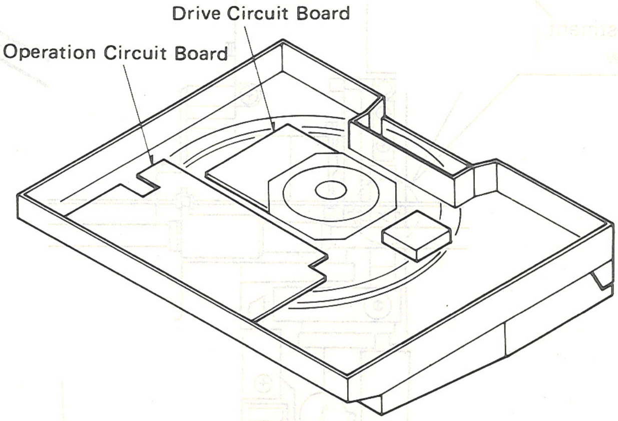

Drive Circuit Board
Operation Circuit Board

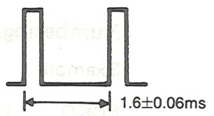
Fig. 10

Turntable does not rotate

Power source circuit
1. AC 16.3V between FC1 terminals ① and ②.
2. DC voltage of regulator IC (IC1).
   ① 18.0V ② 0V ③ 12.0V
3. DC voltage of regulator transistor (Q1).
   Ⓒ 10.3V Ⓑ 5.6V Ⓔ 5.0V

T1, F1
S1, D1~D4
IC1, Q1
D5, RF2
defective

Clock frequency
- Connect between pins ㉙ and ① of IC301.
- Waveform of pin ⑧ of IC301.



IC301
VR301
C301
R301
defective

Push start switch (S302).

Start/stop circuit
1. DC voltage of pin ④ of IC301. (0V)
2. DC voltage of pin ⑩ of IC201. (0V)
3. Are CN101 connector and BT301 connector connected?

S302
IC301
IC201
Connectors
defective

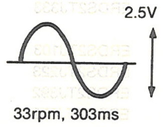
Drive coil and Hall element
1. Conduction check of drive coils (A1 ~ A4)
2. DC voltage of Hall elements (H101, H102)
   ① 3.9V ② 7.8V ③ 3.9V ④ 0V

IC101
Drive coil
H101
H102
defective

Drive circuit (Rotation)
1. DC voltage at each pin of IC101.

|  | ② | ③ | ⑨ | ⑩ | ⑪ |
|---|---|---|---|---|---|
| Voltage | 0.6V | 12V | 5V | 5V | 5V |

2. Waveform between pins.
   ④ and ⑤ (⑥ and ⑦) of IC101.



IC101 defective

No sound comes out

Muting circuit
1. DC voltage of pin ⑩ of IC301
   After the 1.5 seconds when the cueing down, DC voltage of pin ⑩ of IC301 is to 0.8V from 0V.
2. After the 1.5 seconds when the cueing down, DC voltage of collector of Q308 is to 0V from 12V.

IC301
Q308
RL701
D701
C701
defective

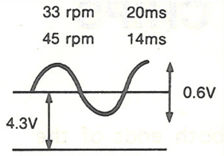
Are tonearm connector and PU lead wire connected? → PU lead wires broken.

Is the stylus completely connected to the cartridge? → Check if stylus is broken or plugged in incorrectly.

Are the tonearm connector and cartridge pins connected completely? → Confirm.

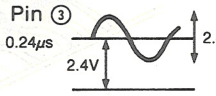
Unstable rotation

FG amplifier circuit
1. Conduction check of FG coil.
2. Waveform of pin ⑮ of IC201.

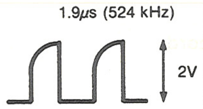


IC201
R203
R205
C201~C203
defective

Quartz oscillator circuit
- Waveform of pins ③ and ④.
- Pin ③

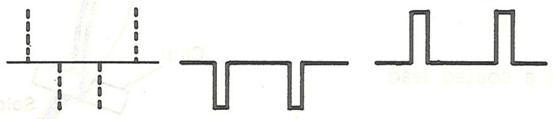


- Pin ④

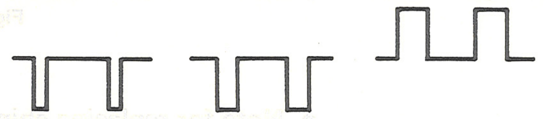


X201
IC201
C204
C205
C206
defective

Speed and phase control circuit
1. Waveform of pin ⑭ of IC201.
   - Stable
   - Slow
   - Fast



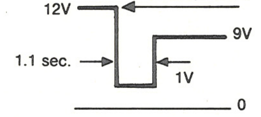
2. Waveform of pin ⑬ of IC201.
   - In-phase
   - Phase lag
   - Phase lead



IC201
IC101
defective

Cueing down/up does not work.

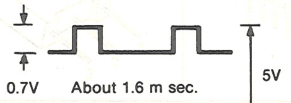
Cueing control circuit
1. DC voltage at pins ② and ③ of IC301
   Pin ② . . . During cueing and down (0.8V)
   Pin ③ . . . Only during cueing down (1.8V)
2. DC voltage of Q302 of collector



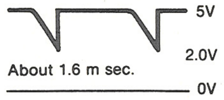
IC301
S305
Q301
Q302
defective

Offset angle does not detection.

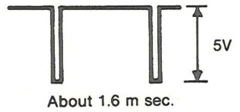
Offset error angle detection circuit
1. Waveform of base of Q306



2. DC voltage of pin ⑥ of IC302 (3.0V)
3. Waveform of pin ⑤ of IC302



4. Waveform of pin ⑦ of IC302



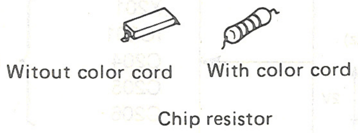
IC301
Q306
IC302
PC501
defective

# ■ HOW TO REPLACE CHIPS

## (Resistor, capacitor and jumper)

### ● Removing procedure

1. Completely remove the solder from both ends of the chip by use of solder suker.
2. Touch the soldering iron to the end of the chip as shown in Fig. **A**, then turn the tweezers in the direction of the arrow.



Do not re-use chip resistor or capacitor without color cord.

### ● Replacing procedure

1. Place solder on the foil where the chip is fitted. Then solder the chip by holding the soldering iron as shown in Fig. **B**.

**Note:**

1. If the chip jumper is removed, connect a coated lead wire to the part. (See Fig. **C**).
   Chip jumper is marked with "J" on the printed circuit board.

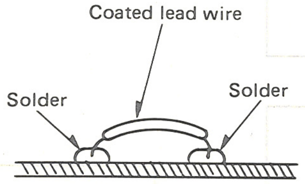


**Fig. C**

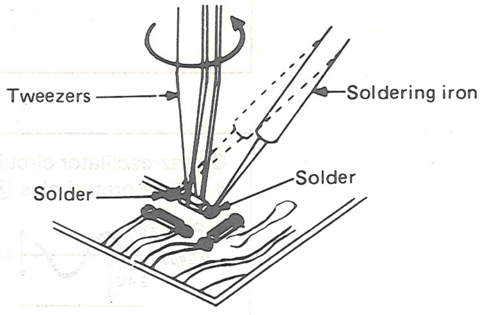


**Fig. A**

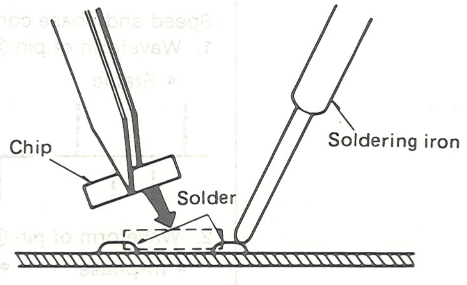
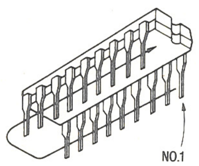


**Fig. B**

### ● Note for replacing chips

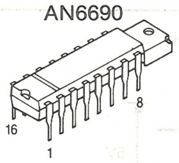
1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering iron less than 60W.

### ● Terminal guide of transistors, and IC's.

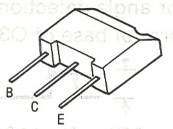


| | |
|---|---|
| AN6914 | 8 pin |
| MN1420 | 40 pin |
| AN6683 | 18 pin |

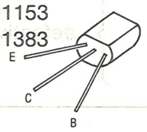
AN6638
AN6690



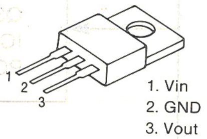
2SB641, 2SD638
2SD636



2SD892
2SD1226
2SD1153
2SC1383



AN7812



# ■ RESISTORS AND CAPACITORS

**Notes:**

1. Part numbers are indicated on most mechanical parts.
   Please use this part number for parts orders.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. This "Ⓢ" mark is service standard parts and may differ from production parts.
4. Unless otherwise specified.
   All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ
   All capacitors are in MICROFARADS(μF), P = $10^{-6}$ μF.

### Numbering System of Resistor

Example

| | | | | |
|---|---|---|---|---|
| ERD | 25 | F | J | 101 |
| Type | Wattage | Shape | Tolerance | Value |

| | | | | |
|---|---|---|---|---|
| ERG | 1 | AN | J | 2R2 |
| Type | Wattage | Shape | Tolerance | Value |

| Resistor Type | Wattage | Tolerance |
|---|---|---|
| ERD : Carbon | 25 : 1/4W | F : ±1% |
| ERG : Metal Oxide | 1 : 1W | J : ±5% |
| ERX : Metal Film | 2 : 2W | G : ±2% |

ERD2FCG□□□ ——► Fuse type carbon (1/4W)
ERDS2TJ□□□ ——► Small type carbon (1/4W)

### Numbering System of Capacitor

Example

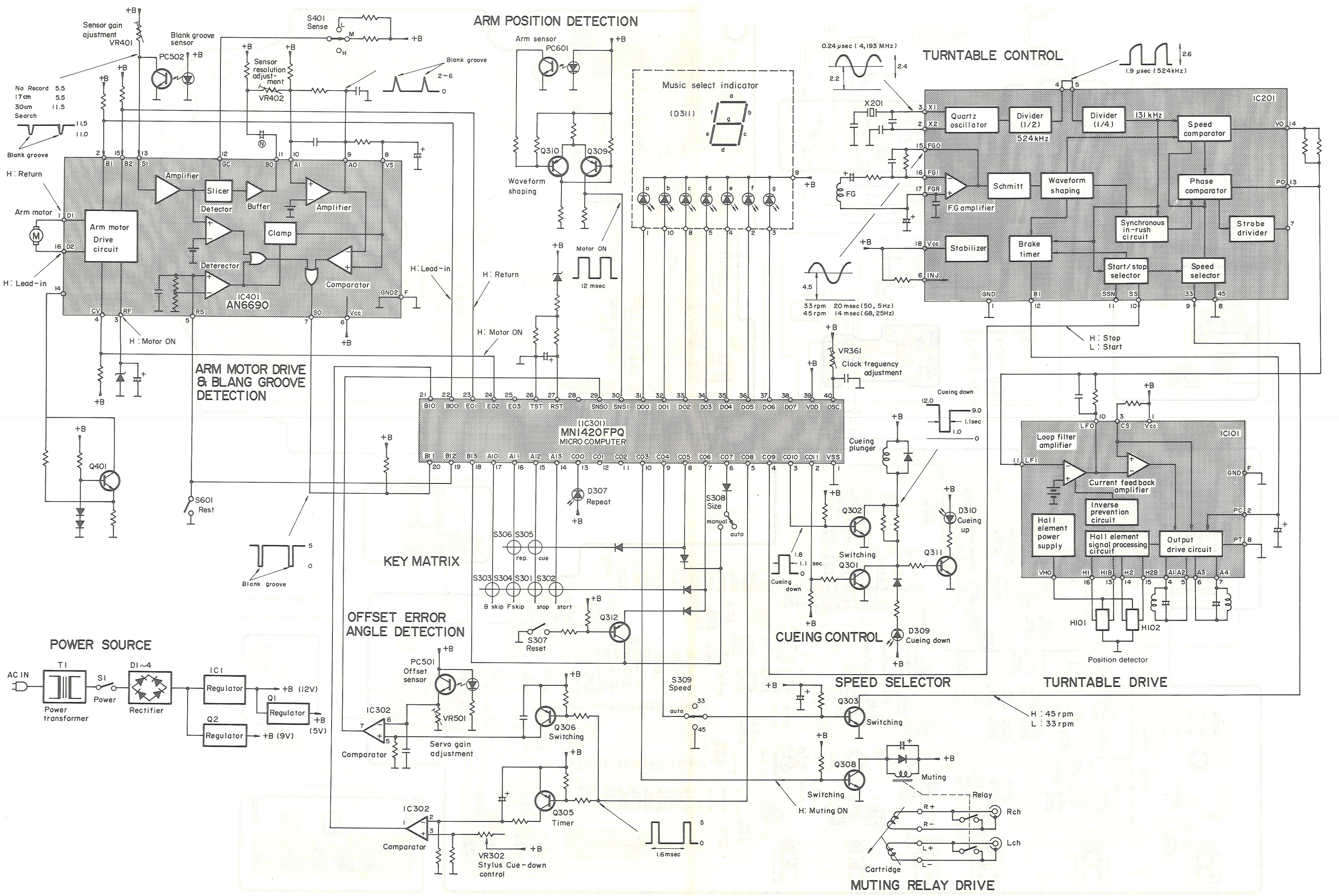
| | | | | |
|---|---|---|---|---|
| ECKD | 1H | 102 | Z | F |
| Type | Voltage | Value | Tolerance | Peculiarity |

| | | | | |
|---|---|---|---|---|
| ECEA | 50 | M | R47 | R |
| Type | Voltage | Peculiarity use | Value | Special use |

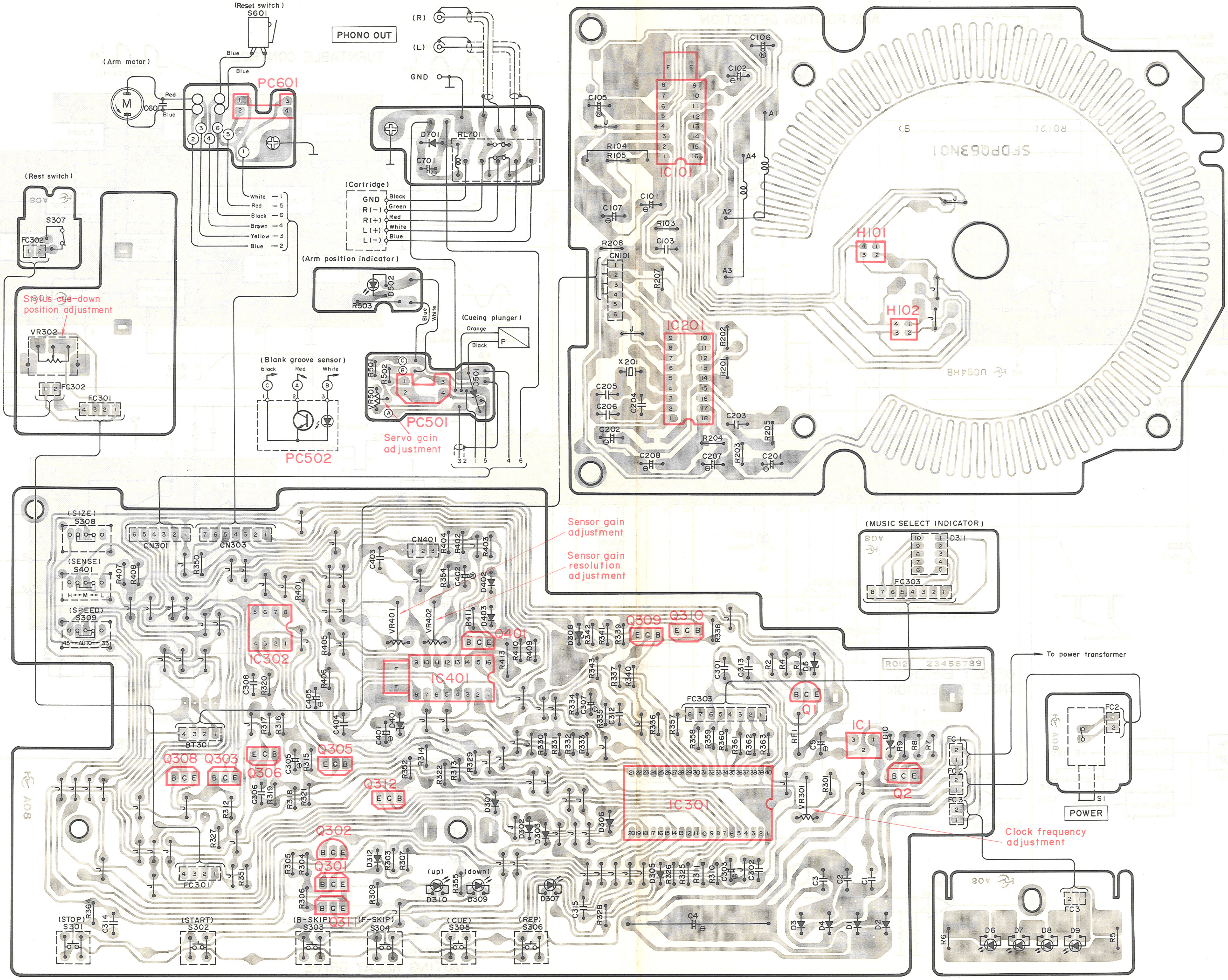
| Capacitor Type | Voltage | | Tolerance |
|---|---|---|---|
| | ECEA Type | Others | |
| ECEA : Electrolytic | 1A : 10V | 1H : 50V DC | J : ±5% |
| ECKD : Ceramic | 1C : 16V | 2H : 500V DC | K : ±10% |
| ECQM : Polyester | 1E : 25V | 1 : 100V | Z : +80%, −20% |
| ECCD : Ceramic | 1V : 35V | | P : +100%, −0% |
| ECKD : Ceramic | 1H : 50V | | M : ±20% |
| ECEB : Electrolytic | 1J : 63V | | |
| ECFR : Ceramic | 50 : 50V | | |
| ECFB : Ceramic | | | |

| Ref. No. | Part No. | Value |
|---|---|---|
| **RESISTORS** | | |
| R1 | ERDS2TJ101 | 100 |
| R2 | ERDS2TJ221 | 220 |
| R4 | ERDS2TJ221 | 220 |
| R5, 6 | ERDS2TJ680 | 68 |
| R7 | ERDS2TJ821 | 820 |
| R8 | ERDS2TJ102 | 1K |
| R9 | ERDS2TJ221 | 220 |
| R103 | ERDS2TJ104 | 100K |
| R104 | ERX1ANJ2R7 | 2.7 |
| R105 | ERDS2TJ270 | 27 |
| R201 | ERDS2TJ273 | 27K |
| R202 | ERDS2TJ394 | 390K |
| R203 | ERDS2TJ680 | 68 |
| R204 | ERDS2TJ151 | 150 |
| R205 | ERDS2TJ223 | 22K |
| R207 | ERDS2TJ102 | 1K |
| R208 | ERDS2TJ680 | 68 |
| R301 | ERDS2TJ562 | 5.6K |
| R303 | ERDS2TJ272 | 2.7K |
| R304, 305 | ERDS2TJ331 | 330 |
| R306 | ERDS2TJ154 | 150K |
| R307 | ERDS2TJ820 | 82 |
| R309 | ERDS2TJ471 | 470 |
| R310 | ERDS2TJ272 | 2.7K |
| R311 | ERDS2TJ562 | 5.6K |
| R312, R313 | ERDS2TJ103 | 10K |
| R314 | ERDS2TJ332 | 3.3K |
| R315 | ERDS2TJ101 | 100 |
| R316 | ERDS2TJ394 | 390K |
| R317 | ERDS2TJ333 | 33K |
| R318 | ERDS2TJ103 | 10K |
| R319 | ERDS2TJ223 | 22K |
| R320 | ERDS2TJ392 | 3.9K |
| R321 | ERDS2TJ272 | 2.7K |
| R322 | ERDS2TJ332 | 3.3K |
| R325, 326 | ERDS2TJ332 | 3.3K |
| R327 | ERDS2TJ472 | 4.7K |
| R328 | ERDS2TJ471 | 470 |
| R329, 330 | ERDS2TJ103 | 10K |
| R331, 332 | ERDS2TJ272 | 2.7K |
| R333 | ERDS2TJ332 | 3.3K |
| R334 | ERDS2TJ102 | 1K |
| R335 | ERDS2TJ821 | 820 |
| R336 | ERDS2TJ103 | 10K |
| R337 | ERDS2TJ472 | 4.7K |
| R338 | ERDS2TJ563 | 56K |
| R339 | ERDS2TJ103 | 10K |
| R340 | ERDS2TJ333 | 33K |
| R341 | ERDS2TJ683 | 68K |
| R342 | ERDS2TJ563 | 56K |
| R343 | ERDS2TJ271 | 270 |
| R350 | ERDS2TJ561 | 560 |
| R351 | ERDS2TJ123 | 12K |
| R352 | ERDS2TJ103 | 10K |
| R354 | ERDS2TJ473 | 47K |
| R355 | ERDS2TJ101 | 100 |
| R357, 358 | ERDS2TJ681 | 680 |
| R359, 360 | ERDS2TJ681 | 680 |
| R361, 362 | ERDS2TJ681 | 680 |
| R363 | ERDS2TJ681 | 680 |
| R364 | ERDS2TJ333 | 33K |
| R401 | ERDS2TJ103 | 10K |
| R402, 403 | ERDS2TJ123 | 12K |
| R404, 405 | ERDS2TJ474 | 470K |
| R406 | ERDS2TJ104 | 100K |
| R407 | ERDS2TJ563 | 56K |
| R408 | ERDS2TJ154 | 150K |
| R409, 410 | ERDS2TJ471 | 470 |
| R411 | ERDS2TJ5R6T | 5.6 |
| R413 | ERG2SJ680H | 68 |
| R501 | ERD25FJ391 | 390 |
| R502 | ERD25FJ271 | 270 |
| R503 | ERD25FJ471 | 470 |
| RF1 | ⚠ ERD2FCG220 | 22 |
| **CAPACITORS** | | |
| C1, 2 | ⚠ ECQG1223KZ | 0.022 |
| C3 | ⚠ ECQG1223KZ | 0.022 |
| C4 | ECEB1EU222 | 2200 |
| C5 | ECEA1CU330 | 33 |
| C101 | ECEA1CU330 | 33 |
| C102 | ECEA50ZR22 | 0.22 |
| C103 | ECQV05274KZ | 0.27 |
| C105, 106 | ⚠ ECEA1AN470S | 47 |
| C107 | ECEA1HU010 | 1 |
| C201 | ECEA0JU470 | 47 |
| C202 | ECEA50ZR22 | 0.22 |
| C203 | ECQM1H683KV | 0.068 |
| C204 | ECCD1H121J | 120P |
| C205 | ECCD1H330JC | 33P |
| C206 | ECCD1H121J | 120P |
| C207 | ECEA0JU470 | 47 |
| C208 | ECEA1AU221 | 220 |
| C301 | ECCD1H101K | 100P |
| C302 | ECFR1E104ZFM | 0.1 |
| C303 | ECEA0JU470 | 47 |
| C305 | ECEA50M1R | 1 |
| C306 | ECQG1H104KZT | 0.1 |
| C307 | ECEA1HU3R3 | 3.3 |
| C308 | ECFR1E104ZFM | 0.1 |
| C312, 313 | ECFR1E104ZFM | 0.1 |
| C314 | ECKD1H681KB | 680P |
| C315 | ECCD1H101J | 100P |
| C401 | ECEA1HUR47 | 0.47 |
| C402 | ⚠ ECEA1CN100 | 10 |
| C403, 404 | ECQG1H473KZT | 0.047 |
| C405 | ECEA1CU100 | 10 |
| C601 | ECFB1B104ZM | 0.1 |
| C701 | ECEA1CU101 | 100 |

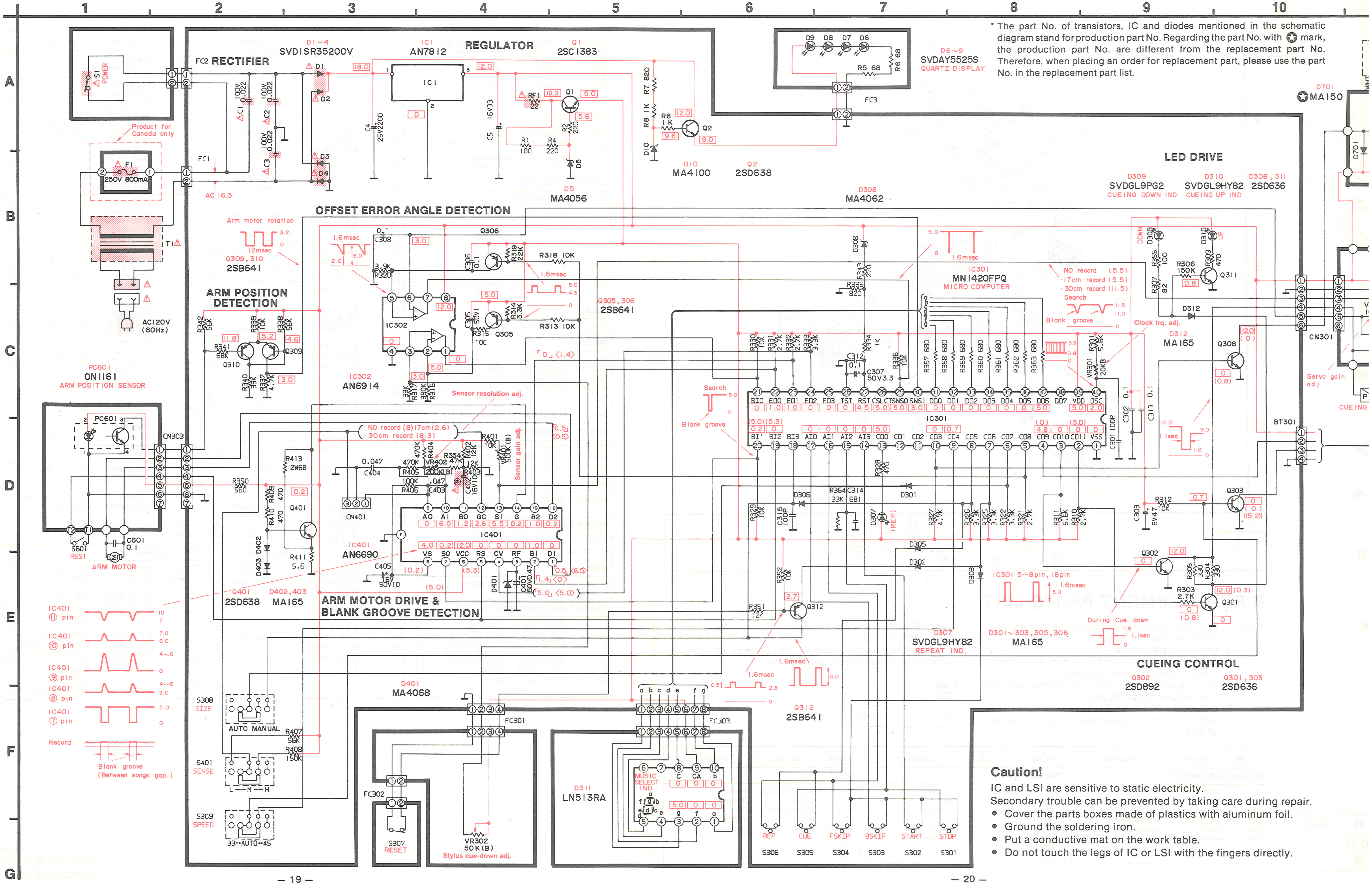
## ■ BLOCK DIAGRAM


ARM POSITION DETECTION
ARM MOTOR DRIVE & BLANG GROOVE DETECTION
TURNTABLE CONTROL
KEY MATRIX
OFFSET ERROR ANGLE DETECTION
CUEING CONTROL
SPEED SELECTOR
TURNTABLE DRIVE
MUTING RELAY DRIVE
POWER SOURCE
Sensor gain ajustment
VR401
Blank groove sensor
PC502
S401 Sense
Sensor resolution adjustment
VR402
Blank groove
2~6
No Record 5.5
17cm 5.5
30cm 11.5
Search
11.5
11.0
H: Return
Arm motor
H: Lead-in
Amplifier
Slicer
Detector
Buffer
Amplifier
Clamp
Arm motor Drive circuit
Deterector
Comparator
IC401
AN6690
H: Motor ON
H: Lead-in
H: Return
H: Motor ON
Q401
S601 Rest
Blank groove
Arm sensor
PC601
Q310
Q309
Waveform shaping
Motor ON
12 msec
Music select indicator
(D311)
MN1420FPQ
(IC301)
MICRO COMPUTER
D307 Repeat
S308 Size
manual
auto
S306
S305
rep.
cue
S303
S304
S301
S302
B skip
F skip
stop
start
Q312
S307 Reset
0.24 μsec (4,193 MHz)
2.4
2.2
X201
Quartz oscillator
Divider (1/2)
524 kHz
Divider (1/4)
131 kHz
Speed comparator
IC201
1.9 μsec (524kHz)
2.6
FG
F.G amplifier
Schmitt
Waveform shaping
Phase comparator
Synchronous in-rush circuit
Strobe drivider
Stabilizer
Brake timer
Start/stop selector
Speed selector
4.5
33 rpm 20 msec (50, 5Hz)
45 rpm 14 msec (68, 25Hz)
H: Stop
L: Start
VR361
Clock freguency adjustment
Cueing down
12.0
9.0
1.1sec
1.0
Cueing plunger
Q302
Switching
Q301
D310 Cueing up
Q311
1.8
1.1 sec
Cueing down
D309 Cueing down
IC101
Loop filter amplifier
Current feed back amplifier
Inverse prevention circuit
Hall element power supply
Hall element signal processing circuit
Output drive circuit
H101
H102
Position detector
S309 Speed
33
auto
45
Q303
Switching
H: 45 rpm
L: 33 rpm
Q308
Switching
H: Muting ON
Muting
Relay
Rch
Lch
Cartridge
PC501 Offset sensor
VR501
IC302
Comparator
Servo gain adjustment
Q306 Switching
Q305 Timer
1.6msec
VR302 Stylus Cue-down control
AC IN
T1
Power transformer
S1 Power
D1~4 Rectifier
IC1 Regulator
+B (12V)
Q1 Regulator
+B (5V)
Q2 Regulator
+B (9V)

## CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM


(Reset switch)
S601
(Arm motor)
M
C601
PC601
PHONO OUT
(R)
(L)
GND
D701
RL701
C701
(Cartridge)
GND
R(−)
R(+)
L(+)
L(−)
Black
Green
Red
White
Blue
White
Red
Black
Brown
Yellow
Blue
(Rest switch)
S307
FC302
(Arm position indicator)
R503
D502
Stylus cue-down position adjustment
VR302
FC302
FC301
(Blank groove sensor)
(Cueing plunger)
Orange
Black
R501
R502
VR501
D501
PC501
Servo gain adjustment
PC502
IC101
C101
C102
C103
C105
C106
C107
R103
R104
R105
R207
R208
CN101
A1
A2
A3
A4
H101
H102
IC201
X201
R201
R202
R203
R204
R205
C201
C202
C203
C204
C205
C206
C207
C208
(SIZE)
S308
(SENSE)
S401
(SPEED)
S309
45
AUTO
33
CN301
CN303
CN401
R350
R407
R408
R401
R402
R403
R404
R405
R406
R354
C402
C403
D402
D403
VR401
VR402
R411
Q401
R410
R409
R413
Sensor gain adjustment
Sensor gain resolution adjustment
IC302
IC401
C308
R320
C405
C404
BT301
R317
R316
C401
D401
Q308
Q303
Q306
Q305
C305
R315
C306
R319
R318
R321
R312
R327
R351
FC301
R352
R314
Q312
R322
R313
R329
D301
Q302
Q301
Q311
R305
R304
R306
D312
R303
R307
R309
(up)
(down)
R355
D310
D309
D307
C315
R328
D302
D303
D306
(STOP)
S301
R364
C314
(START)
S302
(B-SKIP)
S303
(F-SKIP)
S304
(CUE)
S305
(REP)
S306
D308
R342
R341
R339
Q309
Q310
R336
R343
R337
R340
R334
C307
R335
C312
R330
R331
R332
R333
R336
R357
C301
C313
FC303
R358
R359
R360
R361
R362
R363
IC301
R301
VR301
R311
R310
C303
C302
R326
R325
C4
R2
R4
R1
D5
Q1
IC1
D10
R9
R8
R7
C5
RF1
Q2
C3
C2
C1
D3
D4
D1
D2
FC1
FC2
FC3
Clock frequency adjustment
(MUSIC SELECT INDICATOR)
D311
FC303
To power transformer
FC2
S1
POWER
FC3
R6
D6
D7
D8
D9
R5

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
S1 POWER
Product for Canada only
F1 250V 800mA
T1
AC120V (60Hz)
FC2 RECTIFIER
D1~4 SVD1SR35200V
FC1
AC 16.3
IC1 AN7812
REGULATOR
Q1 2SC1383
D5 MA4056
D10 MA4100
Q2 2SD638
D6~9 SVDAY5525S QUARTZ DISPLAY
FC3
D701 ✪MA150
LED DRIVE
D309 SVDGL9PG2 CUEING DOWN IND
D310 SVDGL9HY82 CUEING UP IND
D308, 311 2SD636
D308 MA4062
OFFSET ERROR ANGLE DETECTION
Arm motor rotation
Q309, 310 2SB641
ARM POSITION DETECTION
IC302 AN6914
Q305, 306 2SB641
Sensor resolution adj.
IC301 MN1420FPQ MICRO COMPUTER
NO record (5.5)
17cm record (5.5)
30cm record (11.5)
Search
Blank groove
Clock frq. adj.
D312 MA165
Servo gain adj
CUEING
CN301
BT301
PC601 ON1161 ARM POSITION SENSOR
CN303
S601 REST
ARM MOTOR
NO record (8) 17cm (2.6)
30cm record (8.3)
Sensor gain adj.
CN401
IC401 AN6690
Q401 2SD638
D402, 403 MA165
ARM MOTOR DRIVE & BLANK GROOVE DETECTION
IC401 ⑪ pin
IC401 ⑩ pin
IC401 ⑨ pin
IC401 ⑧ pin
IC401 ⑦ pin
Record
Blank groove (Between songs gap.)
D401 MA4068
S308 SIZE
AUTO MANUAL
S401 SENSE
L M H
S309 SPEED
33 AUTO 45
FC301
FC302
S307 RESET
VR302 50K(B) Stylus cue-down adj.
D311 LN513RA
FC303
MUSIC SELECT IND.
Q312 2SB641
D307 SVDGL9HY82 REPEAT IND.
D301~303, 305, 306 MA165
IC301 5~8 pin, 18 pin
During Cue. down
CUEING CONTROL
Q302 2SD892
Q301, 303 2SD636
REP
CUE
FSKIP
BSKIP
START
STOP
S306
S305
S304
S303
S302
S301

## Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

and diodes mentioned in the schematic
No. Regarding the part No. with ✪ mark,
fferent from the replacement part No.
for replacement part, please use the part

# SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

### IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

### • Product for MC only

### FUSE REPLACEMENT

▭ symbol located near the fuse indicates fast-operating type. For continued protection against fire hazard, replace with same type fuse. Refer to the symbol for fuse rating.

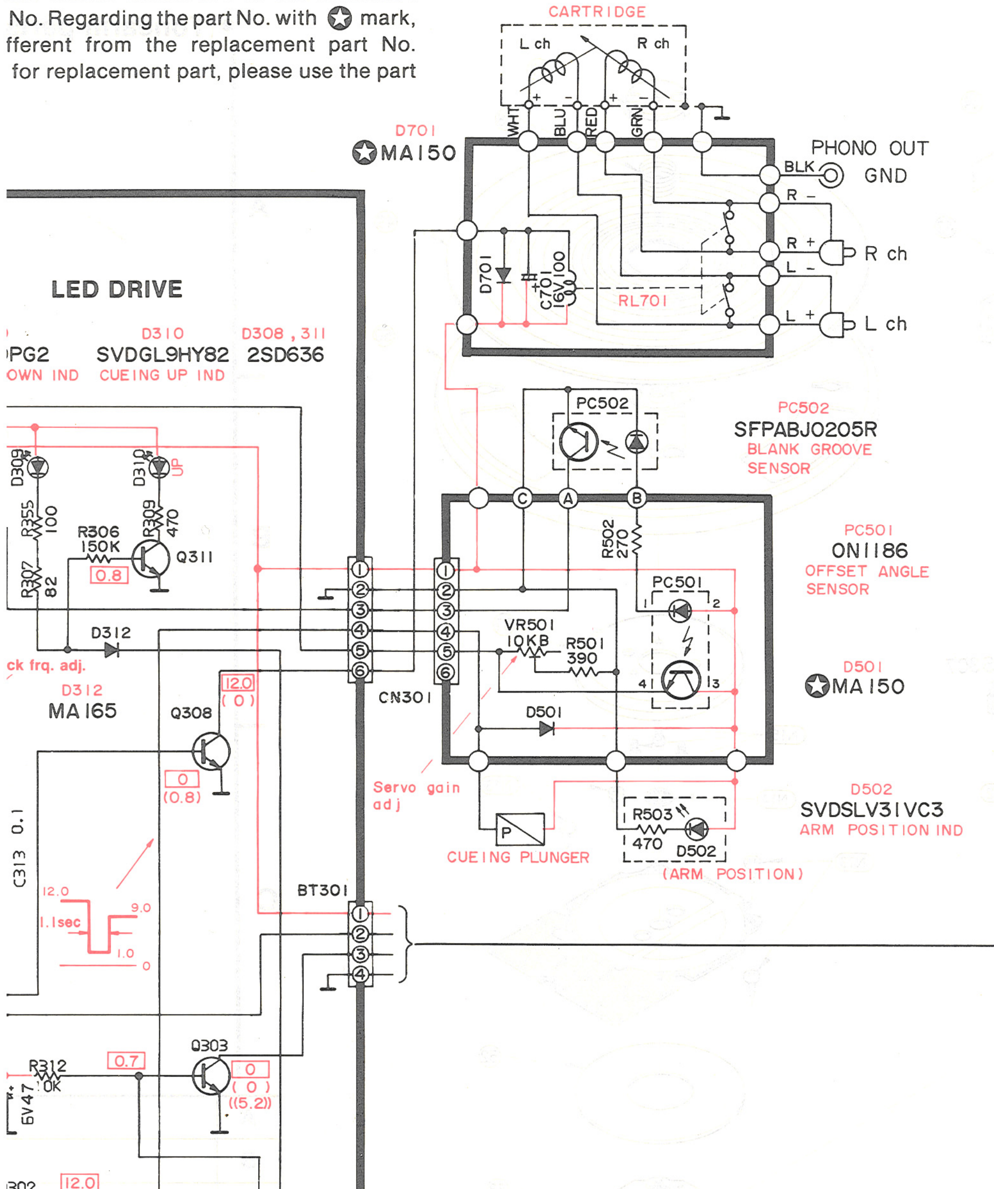
### FUSIBLE REMPLACEMENT

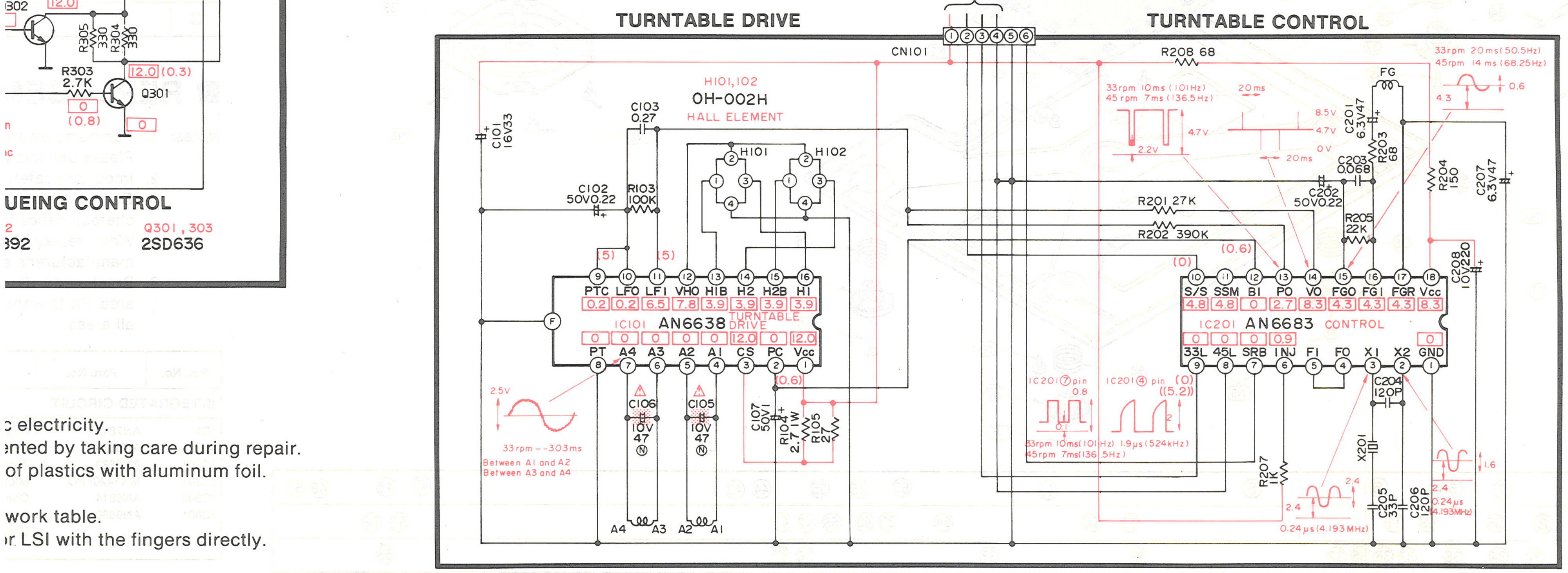
▭ Le symbole qui se trouve près du fusible singifie un fusible à action rapide. Pour une protection continue contre les risques d'incendie, n'utiliser que des fusibles du même type. Se rapporter au symbole pour la valeur des fusibles.

**Notes:**

1. **S1** : Power switch in "**on**" position.
2. **S301** : Stop switch.
3. **S302** : Start switch.
4. **S303** : Backward skip/search switch.
5. **S304** : Forward skip/search switch.
6. **S305** : Cueing control switch.
7. **S306** : Repeat switch.
8. **S307** : Cabinet (Reset) switch in "**on**" position. (Upper cabinet is closed)
9. **S308** : Record size selector switch in "**auto**" position.
10. **S309** : Speed selector switch in "**auto**" position.
11. **S401** : Sensitivity selector switch in "**M**" position.
12. **S601** : Rest switch in "**off**" position. (Tonearm is off the rest position.)
13. The voltage value and waveform are the standard values of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Therefore, the voltage value and waveform may include some error due to the internal impedance of the tester or the measuring unit.
    - * ☐ is the voltage when turntable is stopped.
    - * (　) is the voltage when turntable is in rotating.
    - * ⌈　⌋ is the voltage when tonearm is in lead-in mode.
    - * ((　)) is the voltage when tonearm is in return mode.
    - * <　> is the voltage at 45 rpm.
14. —— Positive voltage lines.
15. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

*The part numbers of diodes mentioned in the schematic diagram stand for production part numbers Regarding part numbers with a ✪ mark, the production part numbers are different from the replacement part numbers Therefore, when placing an order for replacement part(s), please use the part number(s) in the replacement parts list.


CARTRIDGE
L ch
R ch
WHT
BLU
RED
GRN
PHONO OUT
BLK
GND
R ch
L ch
D701
✪MA150
D701
C701 16V100
RL701
LED DRIVE
D310
D308, 311
PG2
SVDGL9HY82
2SD636
OWN IND
CUEING UP IND
D309
D310
R355 100
R309 470
R306 150K
Q311
R307 82
D312
ck frq. adj.
D312
MA165
Q308
PC502
SFPABJ0205R
BLANK GROOVE SENSOR
PC501
ON1186
OFFSET ANGLE SENSOR
R502 270
PC501
VR501 10KB
R501 390
D501
✪MA150
D501
CN301
Servo gain adj
CUEING PLUNGER
R503 470
D502
(ARM POSITION)
D502
SVDSLV31VC3
ARM POSITION IND
C313 0.1
BT301
R312 10K
5V47
Q303


302
R305 330
R304 330
R303 2.7K
Q301
UEING CONTROL
Q301, 303
392
2SD636
TURNTABLE DRIVE
TURNTABLE CONTROL
CN101
C101 16V33
C103 0.27
H101, 102
OH-002H
HALL ELEMENT
H101
H102
C102 50V0.22
R103 100K
IC101 AN6638 TURNTABLE DRIVE
PTC LFO LFI VHO HIB H2 H2B HI
PT A4 A3 A2 A1 CS PC Vcc
C106 10V47
C105 10V47
C107 50V1
R104 2.7 1W
R105 27K
33rpm — 303ms
Between A1 and A2
Between A3 and A4
A4 A3 A2 A1
R208 68
FG
R201 27K
R202 390K
C203 0.068
C202 50V0.22
R203 68
R204 150
R205 22K
C201 6.3V47
C207 6.3V47
C208 10V220
IC201 AN6683 CONTROL
S/S SSM BI PO VO FGO FGI FGR Vcc
33L 45L SRB INJ FI FO XI X2 GND
IC201 ⑦ pin
IC201 ④ pin
C204 120P
X201
R207 1K
C205 33P
C206 120P
33rpm 20ms(50.5Hz)
45rpm 14ms(68.25Hz)
33rpm 10ms(101Hz)
45rpm 7ms(136.5Hz)
0.24μs(4.193MHz)

c electricity.
ented by taking care during repair.
of plastics with aluminum foil.

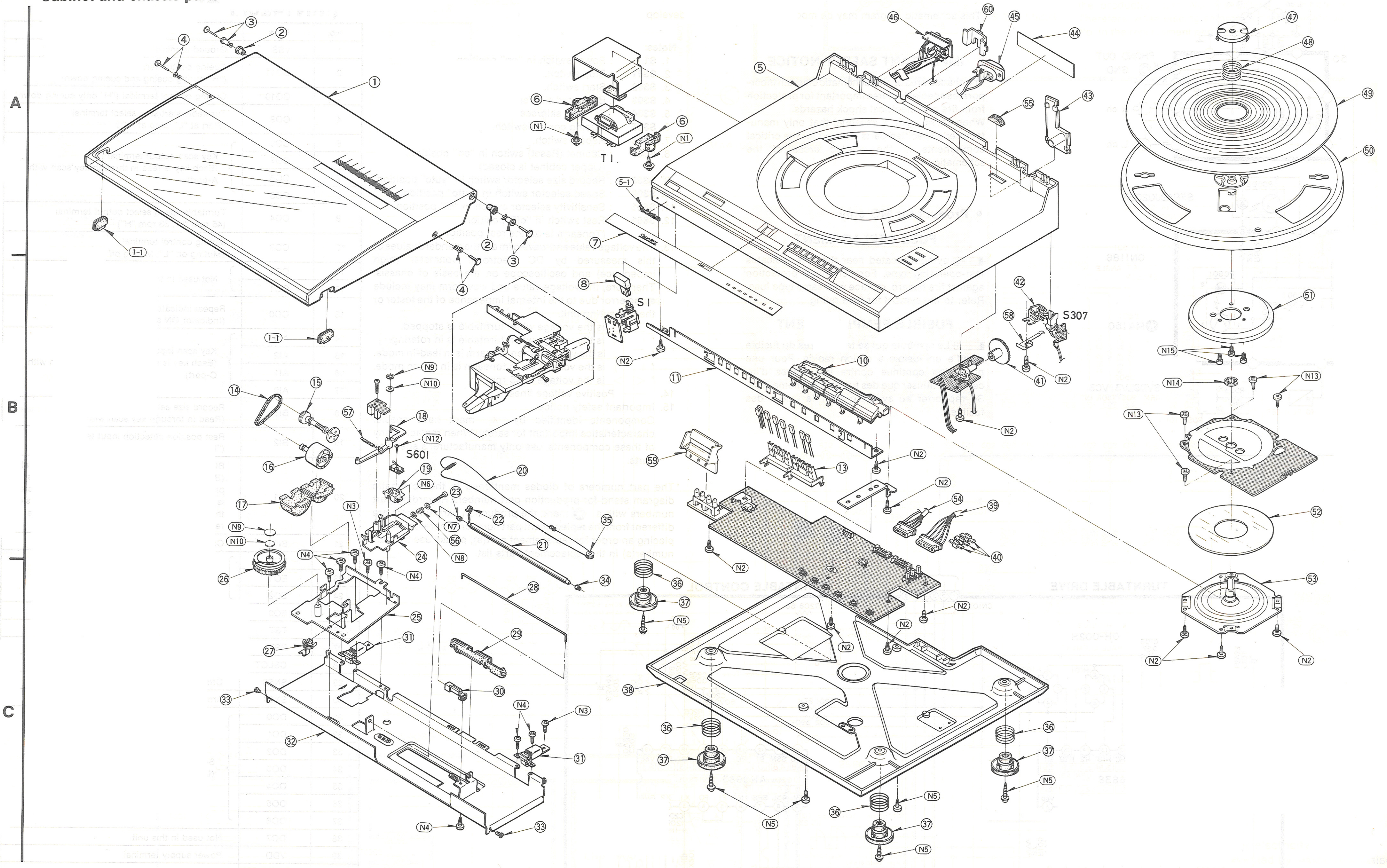
work table.
or LSI with the fingers directly.

# FUNCTION OF TERMINAL (MN1420FPQ)

| No. | Mark | Description |
|---|---|---|
| 1 | VSS | Ground terminal |
| 2 | CO11 | Cueing control terminal ("H" during cueing and cueing down) |
| 3 | CO10 | Cueing control terminal ("H" only cueing down) |
| 4 | CO9 | Turntable start/stop select terminal (Start at "L", stop at "H") |
| 5 | CO8 | Key scan output terminal (Each key is read in through key scan with A-port) |
| 6 | CO7 | |
| 7 | CO6 | |
| 8 | CO5 | |
| 9 | CO4 | Turntable speed select output terminal (45 rpm "L", 33 rpm "H") |
| 10 | CO3 | Muting control terminal (Muting on "L", Muting off "H") |
| 11 | CO2 | Not used in this unit |
| 12 | CO1 | |
| 13 | CO0 | Repeat indicator output terminal (Indicator ON at "L") |
| 14 | AI3 | Key scan input terminal (Each key is read in through key scan with C-port) |
| 15 | AI2 | |
| 16 | AI1 | |
| 17 | AI0 | |
| 18 | BI3 | Record size selector input terminal (Read in through key scan with C-port) |
| 19 | BI2 | Rest position detection input terminal ("L" when tonearm is on rest) |
| 20 | BI1 | Blank detection and record detection terminals. (Blank pulse is active at "L"; 30 cm record is present with "H" at rest position; 30 cm record is not present with "L". When it is at "L" outside the rest position, 17 cm is present; and no is record present at "H".) |
| 21 | BI0 | Cueing time read input terminal |
| 22 | EO0 | Arm motor drive control terminal |
| 23 | EO1 | |
| 24 | EO2 | |
| 25 | EO3 | Not used in this unit |
| 26 | TST | Test terminal |
| 27 | RST | Reset terminal (Micom is reset at "L") |
| 28 | CSLCT | Selest terminal |
| 29 | SNS0 | Offset angle detection signal input terminal |
| 30 | SNS1 | Arm position detection signal input terminal |
| 31 | DO0 | Segment display output terminal (Lights up at "L") |
| 32 | DO1 | |
| 33 | DO2 | |
| 34 | DO3 | |
| 35 | DO4 | |
| 36 | DO5 | |
| 37 | DO6 | |
| 38 | DO7 | Not used in this unit |
| 39 | VDD | Power supply terminal |
| 40 | OSC | Oscillation circuit (Clock frequency is adjusted to 1.6ms) |

## EXPLODED VIEW

- Cabinet and chassis parts


A
B
C
D
E
F
G
A
B
C
①
②
③
④
⑤
(5-1)
⑥
⑦
⑧
⑩
⑪
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
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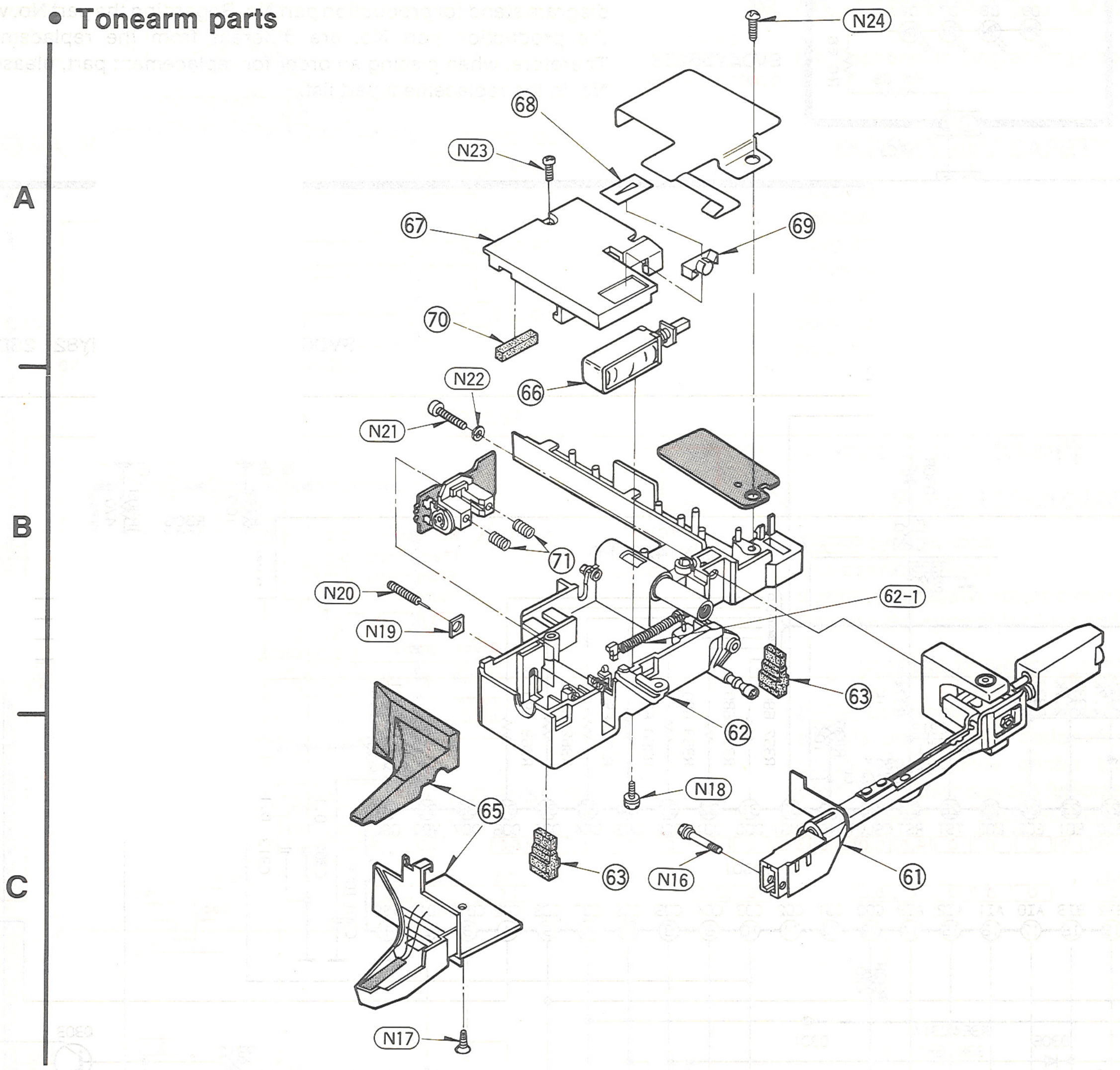
㊿
(51)
(52)
(53)
(54)
(55)
(56)
(57)
(58)
(59)
(60)
(1-1)
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N12
N13
N14
N15
T1
S1
S601
S307

| | |
|---|---|
| A | (1-1) ④ ③ ② ① ② ⑥ ⑦ (5-1) ⑥ ⑤ ㊻ (60) ㊺ (55) ㊹ ㊸ ㊼ ㊽ ㊾ ㊿ |
| B | ⑭ ⑰ ⑯ (1-1) ⑮ (57) ⑱ ㉔ ⑲ ㉓ (56) ④ ③ ㉒ ⑳ ㉑ ⑧ ㉟ (59) ⑪ ⑬ ⑩ (54) ㊴ ㊵ (58) ㊷ ㊶ (51) (52) |
| C | ㉖ ㉝ ㉗ ㉜ ㉛ ㉕ ㉚ ㉙ ㉘ ㉝ ㉛ ㉞ ㊳ ㊲ ㊱ ㊱ ㊲ ㊱ ㊲ ㊱ ㊲ (53) |

## • Tonearm parts



| | |
|---|---|
| A | (67) (70) (68) (69) |
| B | (66) (71) (63) (62-1) |
| C | (65) (63) (62) (61) |

# ■ REPLACEMENT PARTS LIST

**Notes:**

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by a ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "ⓢ" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the columns of description stand for the quantity per set.

### Area

[M]........ U.S.A.
[MC]...... Canada

| Ref. No. | Part. No. | Description |
|---|---|---|
| **INTEGRATED CIRCUIT** | | |
| IC1 | AN7812 | Regulator |
| IC101 | AN6638 | Turntable Drive |
| IC201 | AN6683 | Turntable Control |
| IC301 | MN1420FPQ | Microcomputer |
| IC302 | AN6914 | Comparator |
| IC401 | AN6690 | Arm Motor Drive & Blank Groove Detection |
| **TRANSISTOR** | | |
| Q1 | 2SC1383 | Regulator |
| Q2, 401 | 2SD638 | Regulator |
| Q301, 303, 308, 311 | 2SD636 | Switching |
| Q302 | 2SD892 | Switching |
| Q305, 306, 309, 310, 312 | 2SB641 | Switching |
| **DIODE** | | |
| D1~4 | ⚠ SVD1SR35200V | Rectifier |
| D5 | MA4056 | 5.6V Zener |
| D6~9 | SVDAY5525S | LED |
| D10 | MA4100 | 10V Zener |
| D301~303, 305, 306, 312, 402, 403 | MA 165 | Switching |
| D307, 310 | SVDGL-9HY82 | LED |
| D308 | MA4062 | 6.2V Zener |
| D309 | SVDGL-9PG2 | LED |
| D311 | LN513RAM | LED |
| D401 | MA4068 | 6.8V Zener |
| D501, 701 | ⓢ MA162A | Switching |
| D502 | SVDSLV31VC3 | LED |
| **CRYSTAL** | | |
| X201 | SVQSH41TR | 4.193 MHz |
| **VARIABLE RESISTOR** | | |
| VR301 | EVN61AA00B24 | Clock Frequency Adjustment, 20 kΩ(B) |
| VR302 | EVJE1AF20B54 | Stylus Cue-down Position Control, 50 kΩ(B) |
| VR401 | EVN61AA00B55 | Sensor Gain Adjustment, 500kΩ(B) |
| VR402 | EVN61AA00B25 | Sensor Resolution Adjustment, 200kΩ(B) |
| VR501 | EVNK0AA00B14 | Servo Gain Adjustment, 10kΩ(B) |
| **RELAY** | | |
| RL701 | SFDYQ11N02 | Muting |
| **SWITCH** | | |
| S1 | ⚠ SFDSC02N02 | Power |
| S301~306 | EVQQS405K | Operation |
| S307 | SFDSC05N01 | Reset |
| S308, 309, 401 | SFDSHSW08314 | Size, Speed and Sens Selector |
| S601 | SFDSC02N03 | Rest position |
| **PHOTO INTERRUPTER** | | |
| PC501 | 0N1186 | Offset Angle Sensor |
| PC502 | SFPABJ0205R | Blank Groove Sensor |
| PC601 | 0N1161 | Tonearm Position Sensor |
| **HALL ELEMENT** | | |
| H101, 102 | 0H-002 | Turntable Position Detector |
| **POWER TRANSFORMER** | | |
| **T1** [M] | ⚠ SLT48DTL3A | Power Source |
| **T1** [MC] | ⚠ SLT48DT11C | Power Source |
| **FUSE** | | |
| F1 [MC] only | ⚠ XBA2F08NU100 | 250V, 800 mA |
| **CABINET AND CHASSIS PARTS** | | |
| 1 | SFADC12M01E | Dust Cover (1) |
| 1-1 | SFGZJ02N01 | Rubber Cushion (2) |
| 2 | SFGZC02N01 | Rubber Cushion (2) |
| 3 | SFUMC02N14 | Latch, Dust cover (2) |
| 4 | SFUMQ06N22 | Latch, Dust cover (2) |
| 5 | SFACC12N01E | Cabinet (1) |
| 5-1 | SFKBBD2N01 | Badge (1) |
| 6 | SFGCQ06N02 | Rubber Cushion, Transformer (2) |
| 7 | SFKKC12N01 | Ornament (1) |
| 8 | SRKTK15N26 | Knob, Power (1) |
| 10 | SFKTC13N01 | Knob, Operation (1) |
| 11 | SFUPC13N01 | Guide (1) |
| 13 | SFUMC13N01 | Holder (1) |
| 14 | SFGBC10-01 | Belt, Tonearm Drive (1) |
| 15 | SFUMJ02N07A | Worm Ass'y (1) |
| 16 | SFMHC02N02R | Motor, Tonearm Drive (1) |
| 17 | SFUMC02N07 | Motor Cover (1) |
| 18 | SFUMC02N05 | Lever, Rest Switch (1) |
| 19 | SFUMQ06N09 | Holder, Rest Switch (1) |
| 20 | SFUZC05N02E | Rope Ass'y (1) |
| 21 | SFXJQ06N01 | Guide Rail (1) |
| 22 | SFUMQ06N07 | Clamper, Guide Rail (1) |
| 23 | SFGCQ06N01 | Cushion, Guide Rail (1) |
| 24 | SFUMC02N06 | Base, Rest Switch (1) |
| 25 | SFUPBL3N11E | Base, Motor (1) |
| 26 | SFUML11R03 | Wheel, Tonearm Drive (1) |
| 27 | SFUMC02N10 | Holder, Lead Wire (1) |
| 28 | SFUZC02N01 | Rod, Rest Switch (1) |
| 29 | SFUMC02N12 | Holder, Lead Wire (1) |
| 30 | SFUMV05N23 | Cap (1) |
| 31 | SFATQ06N01E | Hinge (2) |
| 32 | SFUKC13N01E | Base (1) |
| 33 | SFGCQ06N03 | Rubber Cushion, Dust Cover (2) |
| 34 | SFGCC05N05 | Cushion, Guide Rail (1) |
| 35 | SFUMC05N22 | Pulley (1) |
| 36 | SFQCC05N01 | Spring, Insulator (4) |
| 37 | SFGAJ02N01 | Insulator (4) |
| 38 | SFAUC13N01 | Bottom Cover (1) |
| 39 | SFDJC13N03E | Connector Ass'y (1) |
| 40 | SFKTC13N01 | Knob, Selectors (3) |
| 41 | SFKTQ06N02 | Knob, Cueing Down Position Control (1) |
| 42 | SFUMC05N15 | Holder, Reset Switch (1) |
| 43 | SFACC13N011 | Cover (1) |
| **44** [M] | SFNNC12M01 | Name Plate (1) |
| **44** [MC] | SFNNC12C01 | Name Plate (1) |
| 45 | ⚠ SFDJHSC0491 | AC Socket (1) |
| 46 | SFDJJ02N04E | Jack, Phono Output (1) |
| 47 | SFWEC06N01 | 45 rpm Adaptor (1) |
| 48 | SFQAC06N01 | Spring (1) |
| 49 | SFTGQ06N01 | Turntable Mat (1) |
| 50 | SFTEQ05N01 | Turntable Platter (1) |
| 51 | SFTMC07-01E | Rotate Magnet, Turntable Platter (1) |
| 52 | SFMGQ34N01 | Cover, Stator Coil (1) |
| 53 | SFMZC06N01R | Stator Frame Ass'y (1) |
| 54 | SFDJC13N02E | Connector, Ass'y (1) |
| 55 | SFGKQ06N01 | Cap (1) |
| 56 | SFQA913-01 | Spring (1) |
| 57 | SFQHQ34N22 | Spring (1) |
| 58 | SFQPC05N01 | Spring, Reset Switch (1) |
| 59 | SFUMC13N03 | Prism (1) |
| 60 | SFACC13N012 | Cover (1) |
| **TONEARM PARTS** | | |
| 61 | SFPAMJ0201A | Tonearm Ass'y (1) |
| 62 | SFPKDJ0201R | Tonearm Base (1) |
| 62-1 | SFPSP00504 | Spring (1) |
| 63 | SFPGML1101 | Rubber, Guide (2) |
| 65 | SFPABJ0205R | Sensor Ass'y (1) |
| 66 | SFDZC05N01E | Solenoid Ass'y (1) |
| 67 | SFPCS0Q601 | Cover, Sensor Case (1) |
| 68 | SFPAK0Q601 | Plate (1) |
| 69 | SFPCSJ0201 | Case (1) |
| 70 | SFPGM0Q601 | Rubber (1) |
| 71 | SFPSP00302 | Spring, Adjustment (2) |
| **SCREWS, WASHERS AND NUTS** | | |
| N1 | SFXGQ06N01 | Screw (2) |
| N2 | ⓢ XTV3+10BFN | Screw, ⊕3×10 (11) |
| N3 | XTW3+14TFZ | Screw, ⊕3×14 (2) |
| N4 | XTV3+6JFZ | Screw, ⊕3×6 (4) |
| N5 | XTW3+14QFYR | Screw, ⊕3×14 (6) |
| N6 | XSN3+30S | Screw, ⊕3×30 (1) |
| N7 | XWE3D10 | Washer, ϕ3 (1) |
| N8 | XNC3HS | Nut (2) |
| N9 | CSTW3 | Washer (2) |
| N10 | XWE3A8BW | Washer (1) |
| N11 | XTV3+20J | Screw, ⊕3×20 (1) |
| N12 | XTN16+10G | Screw, ⊕1.6×10 (1) |
| N13 | ⓢ XTV3+6BFN | Screw, ⊕3×6 (4) |
| N14 | SFXWC06N02 | Washer (1) |
| N15 | ⓢ XSN3+5S | Screw (3) |
| N16 | SFPEV0Q601 | Screw, Cartridge (1) |
| N17 | XTS26+6JFZ | Screw, ⊕2.6×6 (1) |
| N18 | XYN2+C4FZ | Screw, ⊕2×4 (1) |
| N19 | SFXN623-1 | Nut (1) |
| N20 | SFPTN00301 | Screw (1) |
| N21 | XSN3+12S | Screw, ⊕3×12 (1) |
| N22 | XWA3B | Washer, ϕ3 (1) |
| N23 | XTN23+6JFZ | Screw, ⊕2.3×6 (1) |
| N24 | XTV3+8BFZ | Screw, ⊕3×8 (1) |
| **ACCESSORIES** | | |
| **A1** [M] | SFNUC12M01 | Instruction Book (1) |
| **A1** [MC] | SFNUC12C01E | Instruction Book (1) |
| A2 | SFDHC05N01 | Phono Output Cord (1) |
| A3 | SFDLJ02N11E | Ground Wire (1) |
| **A4** [M] | ⚠ SFDAC05M01 | AC Cord (1) |
| **A4** [MC] | ⚠ SRDA010C01 | AC Cord (1) |
| **PACKING PARTS** | | |
| **P1** [M] | SFHPC12M01 | Carton Box (1) |
| **P1** [MC] | SFHPC12C01 | Carton Box (1) |
| P2 | SFHHC13N01 | Pad, Front (1) |
| P3 | SFHHC13N02 | Pad, Rear (1) |
| P4 | SFHKC05N01 | Clamper, Turntable Platter (2) |
| P5 | SFHKQ06N01 | Spacer, Tonearm (1) |
| P6 | SFHSC13N01 | Spacer, Dust Cover (1) |
| P7 | SFYH60×60 | Polyethylene Bag (1) |
| P8 | SFYH17×16 | Polyethylene, Cord (1) |
| P9 | SFYF33B35 | Polyethylene, Turntable Mat (1) |
| P10 | SFHDD04N01 | Pad, Turntable Mat (1) |

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# Parts Change Notice

Model No. SL–L2
SL–L3

**Service Manual**
**Order No. HAD85052561A9**
**HAD85052563A9**

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

***Reason for Change*** *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

| | |
|---|---|
| 1. Improve performance | |
| 2. Change of material or dimension | |
| 3. To meet approved specification | |
| 4. Standardization | |
| 5. Addition | |
| 6. Deletion | |
| 7. Correction | |
| 8. Other | |

***Interchangeability Code*** **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

| | Parts | Set Production | |
|---|---|---|---|
| A | Original<br>New | Early<br>Late | Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts. |
| B | Original<br>New | Early<br>Late | Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts. |
| C | Original<br>New | Early<br>Late | New parts only may be used in early or late production sets. Stock new parts. |
| D | Original<br>New | Early<br>Late | Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts. |
| E | Other | | |

***Part Number***

| Model No. | Ref. No. | Original Part No. | New Part No. | Notes(*'**) | Part Name & Descriptions | |
|---|---|---|---|---|---|---|
| SL–L2 | 16 | SFMHC02N02R | SFMHJ02N01R | 7, C | Motor (with Capstan) | 1 |
| SL–L3 | 16 | SFMHC02N02R | SFMHJ02N01R | 7, C | Motor (with Capstan) | 1 |

File this Parts Change Notice with your copy of the Service Manual.

**Technics**

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